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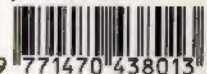
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-Bill Yermal, The Art Guy

"Thank you very much for changing my mistaken order. I am very impressed with the prompt response."
-Vincent Chew, Singapore

"I already bought some content on your website few years ago, and you guys, still rock! Thanks you again, I did my market. Be sure I'll think about you next time."
-Thomas Giraud-Casting, Zoorit

"I'm a big fan of your gallery, but I'd like to aquire something about trees, not just plants. Do you have any idea when could I get some of it? Thanks!"
-Rodrigo Siqueira, Boulder Studios

-We do have now :)

"I'd have to say for my animation purposes these people are awesome. With the motion capture used on these model they really do add another level to Architectural animation. The particular client I am working with said he wanted them in his animation as soon as I showed them to him."
-Tony MacDonald, Arterra Interactive

COVER ART



Pixar

TITLE: THE INCREDIBLES USING: SEE PAGE 26 FOR DETAILS

There was a sense of inevitability surrounding the release of *The Incredibles*. Everyone familiar with the studio's output expected Pixar to hit its sixth Box Office 'home run' in a row, and to achieve this unprecedented feat almost on auto pilot.

However, the film still presented fresh challenges for the company. This is the first Pixar movie to place human characters, albeit cartoony ones, in the spotlight; a shift in focus that must have required plenty of returns to the drawing board to perfect. In fact, in a recent interview with Sam Chen on www.animationtrip.com, Director Brad Bird said: "We really had a tall order with the film. If you were to list the ten most difficult things to do in CG, we did all of them and did a lot of all of them!" And the film's scenario required reconciling weighty themes (Witness Protection, superheroes living all-too-ordinary existences against a backdrop of domestic dysfunction), with Pixar's trademark style of multi-layered, something-for-everyone family entertainment. Yet by hiring Brad Bird (who helmed the classic 2D animated film *The Iron Giant*) from the 'outside' to direct *The Incredibles*, the company seems to have realised that the formula for success lies in constantly challenging the limits of its own formula. So turn to our feature on page 26 to find out, once again, how the Pixar phenomenon has been refined...

[w] www.pixar.com



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>> *3D World* presents the golden rules of creating the perfect showreel to secure a job in the 3D industry



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The Incredibles

>> Pixar's superhuman animation talents come spectacularly to the fore in *The Incredibles*, a comedy about a family of superannuated superheroes. 3D World examines the art and technology that make up the company's winning formula



048 Character creation in 3ds max 7

>> Follow Chris Ollis's tutorial to master the new character tools in the demo of Discreet's 3ds max 7, free on this issue's cover CD

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>> Chris Ollis shows you how to unlock the power of the new character tools in the 3ds max 7 demo free on the cover CD

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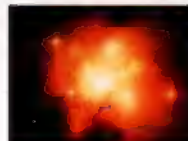
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>> Full-size screengrabs and 3D resources necessary to follow the tutorials in the magazine

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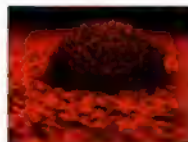
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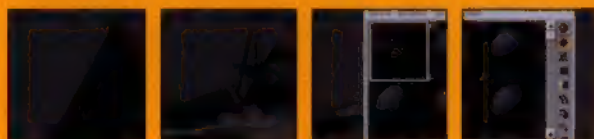


3ds max 7 (demo)

Try this demo of the latest version of Discreet's legendary 3D modelling, animation and rendering software. The demo runs out after 30 days, but's otherwise full featured.

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3ds max 7 – bonus tutorials

Also on the disc – for the first time on a magazine cover CD – you'll find a bonus set of 3ds max 7 tutorials to help you familiarise yourself with the software.

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Character creation in 3ds max 7

The full-size screenshots and MAX files necessary to follow Chris Olla's excellent tutorial introducing users to the new character-creation tools in 3ds max 7, starting on page 48.

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QUICKTIME



Bluescreen on a budget

To help you create a bluescreen studio for under \$100, we've included the full-size screenshots to go with our tutorial on page 68, plus the source and composited footage.

>>> www.3dworldmag.com

PLUS

WHERE ARE THE Q&A FILES?

Your cover CD includes all the full-sized screenshots and project files necessary to complete the tutorials printed in the magazine this issue, and project files for the Q&As. However, due to the space occupied by the 3ds max 7 demo, there has not been room to include screenshots for the Q&As. These can be downloaded from our website at the URL below.

>>> www.3dworldmag.com/stoppres

Full listings on the CD sleeve

Software not working as expected? Can't find those tutorial files? Check out the instructions inside our CD inlay for the solutions to the most common disc-related problems.

editor's perspective



A few years back, there was one surefire way of telling whether a Hollywood movie consisted of 3D animation, or live action with visual effects (beyond the obvious expedient of looking to see whether its stars were real actors or simply figments of the director's imagination – which, in the case of anything starring Hayden Christensen, might not be as easy as it sounded). The rule was this: if the movie was under 100 minutes long, it was animated. Longer, and it was live action.

Now, however, that boundary is crumbling. Of the two most recent full-length animated films, *The Polar Express* testers on the brink of three figures, while this month's cover movie, *The Incredibles*, clocks in at a genre-blurring 115 minutes.

The similarities with live action don't end there. In order to generate the volume of footage required, both movies also borrow techniques from conventional film-making. In the case of *The Polar Express*, this meant extensive use of motion capture; for *The Incredibles*, Pixar not only divided its team into first and second units – one working on animation, the other on backgrounds – but treated its characters as if they were being shot against greenscreen, and even (whisper it) threw in elements derived from live footage.

But is more necessarily better, particularly in work of this type? Golden Age Disney movies last less than 85 minutes, yet are regarded as shining examples of the craft. To sit through a modern effects blockbuster, in contrast, requires not only a willingness to accept a 21-year-old Canadian as the most evil man in the galaxy, but a bladder of steel.

With *The Polar Express*, the jury is still out. ("Labourled" and "steroidal" are not the two unkindest adjectives that US critics have applied to the movie.) As for *The Incredibles*... well, decide for yourself. But for our money, Pixar began with a compelling story, then constructed the production pipeline necessary to bring it to the screen; not the other way around.

If the studio keeps making movies this tightly crafted, it could remake the whole of Wagner's *Ring* cycle in 3D, and you'd still find us in the front row of the audience. Although you'd probably find that we'd been to the toilet in advance...

JIM THACKER Editor
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MAILBOX

BY POST: 3D World, 30 Monmouth Street, Bath, BA1 2BW, UK

letter of the month

As a hobbyist animator – well, I call it a hobby, but it's so time consuming it might as well be called a 'black hole', sucking all my time away – I was dismayed by the reactions of the software developers you interviewed in your *SoftimageXSI* price cut story [Newsdesk, issue 58]. Now call me impatient, but... I've always been into creating art and music using computers. When I went to college I did both subjects, and I enjoyed them both, and I was probably as good at one as I was at the other, more or less. Anyway, when I left a couple of years ago, I took a look at careers in the music industry and thought, "Sod that for a game of soldiers, I'll get into CG instead, as that's where the cash is. How hard can it be?"

Ha! Until recently, I was trying to make a short film, unfunded, on my own. I had it in mind as a five-minute thing, set in a zoo with talking animals, a bit of a lark, just to see if I could do it. But six months, thousands of lonely hours, and millions of aborted tests on billions of un-animal-like models later, I'm finally going to admit defeat. I just don't have the patience – or perhaps it's the talent – to be an animator.

So I reckon I'm going to spend my time making music instead. I can do it with my mates in a band for a start, an obvious advantage over animation, which is hardly the most collaborative of pastimes ("Alright Kev, coming over to keyframe the movement of a King Penguin for the next 18 hours without a break? Oh right, you're off down the pub instead..."). I can get results quickly (sometimes in the time it takes just to read the manuals and figure out how to master something pretty minor in a 3D app). And I can put my creations on in my car on the drive back from the studio – again, unlike CG, where my two-and-a-half year animated labour of love might even end up being shown to a crowd of people half paying attention to it at a handful of film festivals, if it's really exceptional.

My question for all these developers isn't what new features the new versions of their software will have – nor is it how much research and development are they going to put into making their stuff even more complicated. It's simply this – in this day and age, when you're starting out, why does 3D still have to be so hard to do?

Chris Leighton | Via email

EP *Whoa! Don't throw in the towel just yet. 3D animation is certainly a complex, demanding process, and only you can decide whether you want to invest the necessary time and effort. But isn't that true of any genuinely aspirational activity? Think back to when you first started making music. You probably put in thousands of hours of practice: hours you now call upon unconsciously every time you go into the studio. And while it can be tough to get exposure for your work, is it really any different for any of the bands whose demos now languish on online download sites, or in the graveyard slots of local radio stations? Under the circumstances, our Letter of the Month prize – a book-length collection of the best recent 3D imagery – may seem ironic, but we hope that it might help persuade you that the results of persevering with the subject will be worthwhile in the end.*



3D animation: a fulfilling occupation, or a 'time-sucking black hole', as reader Chris Leighton now believes?

© NASA, JPL-Caltech, R. Kennicutt (University of Arizona)



Les Triplettes de Belleville: proof that feature-length animation exists outside the Hollywood system

ADULT EYES ONLY

>> Your letter from Helgard de Barros on the theme of adult-oriented animation [see Letter of the Month, issue 58] made some interesting points, but suffered from a lack of historical perspective, and a narrow cultural range.

De Barros stated that he knew of no successful CG films that were aimed at an adult audience, and that the same was true of 2D films. Although it is debatable what constitutes an 'adult' audience, in pre-CG films there was the original *Lord of the Rings* (which was largely rotoscoped over live action, if a 20-year-old memory serves), and a film from my very early teens called *Fritz the Cat* [both movies were directed by Ralph Bakshi – Ed.] which if not 'adult', were certainly aimed at post-pubescent. Was *Yellow Submarine* aimed at the early screaming fans, or those who'd matured with the Beatles over the years? And while I haven't seen that many examples myself, I understand that most Japanese anime is aimed at adult viewers.

In the world of animated shorts, there is also a substantial

body of work aimed at an adult audience, from the pre-war work of Len Lye for the GPO, through Norman McLaren to the work of Terry Gilliam for the *Monty Python* TV shows. Much Eastern European animation is aimed at an adult audience, from Jan Svankmajer to Yuri Norstein, with many in between.

Given that the animation industry is still relatively young compared to other forms of drama and storytelling, the production of adult films can only increase. And if that is true of traditional films, it must surely be true for CG, which is arguably only 15 to 20 years old. As the audience matures with the medium, the stories will mature with the audience.

Simon Edmondson | Via email

EP *To me, shorts would seem to be a separate case to feature films, which were the focus of Helgard de Barros' letter. Since the costs are much lower, it has always been easier to fund this kind of work outside the Hollywood system. However, you are certainly right to point out that full-length animated movies exist outside of the*

WRITE IN AND WIN A PRIZE!

Each issue, we award a prize to the sender of our Letter of the Month. Next issue, it's a copy of *Elemental*, Daliotic Publishing's coffee-table compendium of digital art created using Discreet software products. Featuring over 250 stunning images produced with 3ds max, character studio or combustion – the work of 147 artists from 36 different countries – *Elemental* is an inspiration resource for any 3D artist. To order a copy of the book, visit www4.discreet.com/buy

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#009

Disney/DreamWorks axis – a tradition that continues to this day, with films such as *Waking Life* and *Les Triplettes de Belleville*. This subject is now closed for correspondence, but you can post your views online in the 3D World forum.

ZEROUNI-PHOBIC?

» I am utterly dismayed by your having let Craig Zerouni's article on pay packages [Letter From Hollywood, issue 58] go through in its present bile-spewing form. While compensation may be a hush subject among most people, regardless of nationality, I can conceive of no reason he had to use examples of loud Americans as his lead-in: it displayed a venom that was unnecessary for the subject at hand, and it was quite offensive to me, a US citizen.

Is Craig so daft as to believe that *3D World* is only read in countries other than the US? Shouldn't he know that *3D World* is, in fact, readily available at most major booksellers? Or does he believe that any non-American revels in bad-mouthing a "Yank" whenever their back is turned?

I'm sure your response will be one of "don't take it so seriously," or "he was just joking around," but for this man to live in the US and make a living here, it is just unconscionable for him to

begin an article in that manner.

Ultimately, however, I must place the final onus on you, the Editor, as it's your job to make sure your correspondents' articles are on point, and don't stray off into erroneous territory: especially when those tangents involve disgusting xenophobic behaviour, even if it is "sheltered" in the faux-guise of humour.

Davis Coleman | Los Angeles

EP *Although it does not say so explicitly on his biography at the foot of the column – something we should perhaps address in future issues – Craig Zerouni is an American citizen, currently living and working in Santa Monica, CA for a major 3D developer. In that light, I read the introduction to his article on rates of pay as ironic self-deprecation, in keeping with the tone of many of his previous opinion columns. Clearly, not everyone interpreted Craig's words in the same way, which I can only regret. It was absolutely not our intention to cause gratuitous offence to any part of our readership.*

FROM THE FORUM

» As an illustrator who employs 3D in his still images, I'm a little sensitive these days. Like big-time CG, illustration has been through the wringer lately, and I'd say it's in its death

throes. A few complaints:

publishers only buying from stock websites for a fraction of the cost instead of commissioning new work. Reps who demand copycat samples, fostering trends that change by the month instead of nurturing original style. And worst of all (pay attention, art graduates): you know all those kids that graduated with you in art school but were blatantly, stunningly untalented? Half of them now work at Starbucks; the other half are now proudly labelled 'Marketer' or 'Art Co-ordinator' or even the almighty 'Art Director'. They're bitter and abusive to artists, yet some of them are the first and last word on new art in a company.

OnDrawnWings | Via the forum

EP *That sounds like a cry from the heart. Other cries included the relative price of 3D software on either side of the Atlantic (General Discussion > The American Price Advantage), and – lurking into a different gear, buckle's 2,310th post. In celebration, he asked for either a free subscription or a mention in the magazine. Guess which one we've opted for?*

Don't know what we're talking about? Head over to the site at <http://forum.3dworldmag.com> and find out for yourself!



Working as a freelance artist may be demanding, but is life in the modern 3D illustration industry really as tough as reader OnDrawnWings concludes? Have your say online at <http://forum.3dworldmag.com>

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QUOTES OF THE MONTH >>

"Performance capture is this year's green screen. Even the guy at the car wash is talking about the technique"

Craig Zerbini,
LETTER FROM HOLLYWOOD

p12

"The concept in *Video Mods* works because you feel like that *Need for Speed* character is really rocking out on the electric guitar"

Tom Tolles,
HOUSE OF MOVIES

p13

"Some shots were logistical nightmares. You had 3D rocks, 2.5D rocks, matte painting in the background, up to eight layers of the Pegasus spaceship that had to be rendered individually and built up..."

Darren Byford
FRAMESTORE CFC

p15

"If we were offered a load of money to produce a cinematic for a *My Little Pony* game, I very much doubt we'd take it"

Steve Wilson
BLUR STUDIO

p18



64-BIT GENERATION

As NewTek announces plans to port *LightWave* to 64-bit platforms, the 64-bit 3D revolution is well and truly underway. But hype aside, how will the next generation of 64-bit hardware and software improve your life?

ANALYSIS Data – there's an awful lot of it about. And in the world of 3D, ports of 64-bit apps (like NewTek's recently announced plans for *LightWave*) promise to answer the need for speed. The more bits you can shunt around in a single operation, the faster your computer will be, and the more memory that can be addressed.

Expensive, high-end server processors such as the Itanium family are 64-bit, and non-Windows platforms such as Linux, the SGI and Alpha workstations also operate in 64-bit. However, until recently, this 64-bit

high-performance FX-64, and the server and workstation-targeted, multi-processor Opteron. These 64-bit processors are capable of running both 32- and 64-bit code, but in order to take full advantage of them, you need a 64-bit operating system (Microsoft has conveniently made a beta version of its Windows 64 operating system available as a free download).

Meanwhile, AMD's £850 (\$827) FX-55 processor is setting the creative world on fire with its record-breaking performance, and the company has a well-received roadmap for the further rollout of 64-bit processors over the next six months.

addressing, increasing addressable memory from Gigabytes to Exabytes (over a thousand million Gigabytes!). While this certainly doesn't provide the overall performance enhancements of a true 64-bit processor, it does deal with what is considered to be the greatest performance bottleneck. Shame it won't be implemented across the entire desktop range...

64-BIT LIGHTWAVE

NewTek says it has ported *LightWave* for the low- and mid-range 64-bit Windows platforms – the Pentium, Xeon, and all three AMD processor families. The company was uniquely positioned to make the transition to 64-bit, because *LightWave* has migrated to the PC from the DEC Alpha, which was a 64-bit platform way back when. This meant *LightWave* had always been constructed to be 64-bit legal (it didn't violate 64-bit addressing requirements), so it was easier to convert than it might otherwise have been. NewTek's Ben Vost said: "The 64-bit version of *LightWave* leverages the power and range of capabilities of 64-bit technology, including increased processor power and greater memory capabilities. Of particular value is the ability the 64-bit system provides for faster memory access for loading and swapping large scene files."

We spoke to other key players to get their view on the value of 64-bit. Graphics card manufacturer ATI says that it's already on its third generation of 64-bit drivers, and the company will update them on a monthly

Whether you're an Intel or AMD fan, a gamer or an artist, 64-bit is coming – and it'll be a change for the better. The memory and processor hungry 3D sector will reap the greatest benefits

technology has been prohibitively expensive for the workstation and consumer markets.

With the increasing amounts of data being manipulated even by humble games machines, to say nothing of the vast amounts created in creative packages, development of mass-market 64-bit processors has become cost-effective.

AMD was first to cater to this low-cost market, with three products; the entry-level Athlon 64 released in April last year, the

Intel has been slow off the mark, and this has led some industry commentators to speculate that AMD's success may have derailed the company's development strategy for the foreseeable future.

In what can only be seen as a stop-gap measure, Intel has announced the introduction of EM64T technology to its Xeon and workstation versions of the Pentium 4 processor. This is a strange technology hybrid that enables 32-bit processors to use 64-bit memory

basis. European Marketing Manager Andrzej Bania said: "We hope that the 64-bit OS [Windows 64] will provide a faster data flow to the GPU in order to overcome existing system bottlenecks."

Discreet's 3ds max Product Manager Dan Prochazka observed that "64-bit is clearly an important area that addresses fundamental problems. Higher levels of expectation mean project sizes are increasing. Scene sizes become exorbitantly large, so while 64-bit does not make systems faster per se, Windows 64 does destroy another important barrier."

Perry Stacy, MD of Maxon in the UK was also circumspect. "At the moment there seems to be a lack of consensus between the key players [Microsoft, Intel and AMD] about the precise form 64-bit computing will take. When a stable 64-bit platform with mass-market support appears, Maxon will be there to support it."

As with many a new computing technology, the games market is both the driving engine and first beneficiary of the improvements. AMD's Theresa Zimmer concurred: "Games will be the first area to see the benefits. Extra addressable area enables much greater realism in first-person shooters, as high-res textures and large datasets are whipped around in memory much faster than ever before." There are already 64-bit versions of games, with *Unreal Tournament* (2004) among the first.

Whether you're an Intel or an AMD fan, whether you're a gamer or an artist, 64-bit is coming, and it'll be a big change for the better. Our memory and processor-hungry sector will enjoy the greatest benefits. As usual, its mass-market emergence isn't without birth pangs, but this is yet another new technology where Microsoft holds the trump card.

www.newtek.com

SWIFT 3D 4

»PRODUCT Flashy plug-in comes to the Mac OS

Electric Rain's *Swift 3D 4* and *Swift 3D Xpress* are now available for Mac OS X. *Swift 3D* is a standalone app which can build and export vector and raster 3D animation to the *Flash SWF* format, among others, without requiring user to have a working knowledge of *Flash* programming.

Swift 3D Xpress, meanwhile, is a *Flash* plug-in which converts 2D artwork and text to 3D animations, entirely from within the program. *Swift 3D 4* costs \$189 on both Windows and Mac, while *Swift 3D Xpress* is yours for \$129. www.eraim.com

FREE CORE

»PRODUCT corearsenal plug-ins available for free

CORE has released the quirkily monickered *corearsenal*, which consists of three new plug-ins for *Cinema 4D* - *VIXOR*, *RALF* and *COREPARTICLETOOLS*. *VIXOR* is a render and video post-effect tool, and uses the RGB colour channels of an image to represent XYZ data for various special effects. *RALF* is a particle sequence importer that works specifically with Next Limit's *RealFlow*. Finally, *COREPARTICLETOOLS* is a suite of advanced particle effects which integrates with *C4D*'s *Thinking Particles* system. All three are available for free download. www.corearsenal.com

A new town in six weeks

How do you render a totally new town from scratch? Ask architectural company Split Image, that's how...



When PR company Communicate needed to visualise the planned 8,000-home new town of Northstowe near Cambridge, they turned

to Split Image to help out. The architectural company produced a DVD flyover, mixing footage shot from a helicopter with a detailed 3D rendering. With footage shot on HD incorporating a lot of greenscreen, a kit of very low-poly buildings was then created, and orientated within the comp using *PFTrack*. "The establishing helicopter shot was the most challenging," said Split Image's Tom Bridge. "We threw an arsenal of tools at it: *Cinema 4D*, *Shake*, *PFTrack*, *PFStable*, and *After Effects*. Part of our brief was to avoid absolute photorealism: we were tasked with creating an impression rather than recreating reality." www.split-image.co.uk



»PROJECT FOCUS

HOBBIES

New animations from Bristol award-winners Shufti reveal how misfits pleasure themselves



How long were you away from the drawing boards any more? *Hobbies*, a series of six one-minute animations from new Bristol studio Shufti, examines the quiet universe of obsessive passions. It's a number of humorously deft characters: the misfit insect breeder, the inventor, the TA not, and the bus watcher. Directed by Nick Mackie and written and performed by Pete Avery, *Hobbies* came about after the pair won the 2003 BBC Television Animation Award. "The prize for winning was a commission to make more *Hobbies*," says Nick. "We've been working closely with Helen Neeley and Jim Campbell at BBC Animation Bristol."

But the idea goes back further than that. "Originally Pete and I did some improvised sound recordings," Nick explains. "The original film, starring Weir, a model bus collector, came out of these sessions. Amazingly, we've been friends for 20+ years and this is the first project we've actually got off the ground!" Each episode took around two to three weeks to make, with animation aided by Aardman stalwart Miki Cech. "Once we have the final sound edit and script I have to try and design a character that I feel fits the voice and story," says Nick. "I use Maya, which I've been using for three years and still love."

And if the results look vaguely Aardman-esque, it's no surprise: Nick worked there for six years before leaving to join Pionese Pictures, while setting up Shufti for broadcast projects. "One of the main technical problems was to make the CG animation look more like stop frame," he says. "It takes a while to work out an easy way of doing that. I'm not a big fan of slick, smooth CG animation. I'm keeping this technique a secret, but I thought I'd mention it on the web." www.shufti.co.uk

Hobbies	
TITLE	<i>Hobbies</i>
PRODUCTION COMPANY	Shufti Animation
DIRECTOR	Nick Mackie
RUNTIME	Six lines one minute
TEAM SIZE	Five
TIME TAKEN	Around four months
SOFTWARE USED	Maya Photoshop Premier

It's taken over a year, but after a trip to see Shark Tale, Craig finally admits – ready everyone – he was wrong!

[illegible]

1. What is the main purpose of the document?
 2. What are the key findings of the study?
 3. What are the implications of the findings?
 4. What are the limitations of the study?
 5. What are the conclusions of the study?
 6. What are the recommendations of the study?
 7. What are the future research directions?
 8. What are the acknowledgments?
 9. What are the references?
 10. What are the appendices?

1. Definition
 2. Properties
 3. Examples
 4. Applications
 5. Conclusion

CRAIG ZEROUNI
zerouni@earthlink.net

» **PRODUCTS** A bundle of updated fun from the masters of compositing

Discreet has been busy behind the scenes, and has just unleashed a slew of new versions of many of its high-end compositing tools. Now available are (and it's time to take a deep breath), *Inferno 5*, *Flame 9*, *Flint 9*, *Fire 6.5*, *Smoke 6.5*, and *Justo 2.5*.

Composers and effect apps **inferno**, **lume** and **luma** are often used together, and many of the new features focus on collaboration tools such as open file access, the ability to add schematic notes, and support for Photoshop's PSD format. There's also a new spine-based warping and morphing tool, a handy

3D look-up-table for enhanced colour fidelity, an improved version of the 3D Tracker, and clip history enabling easy edits.

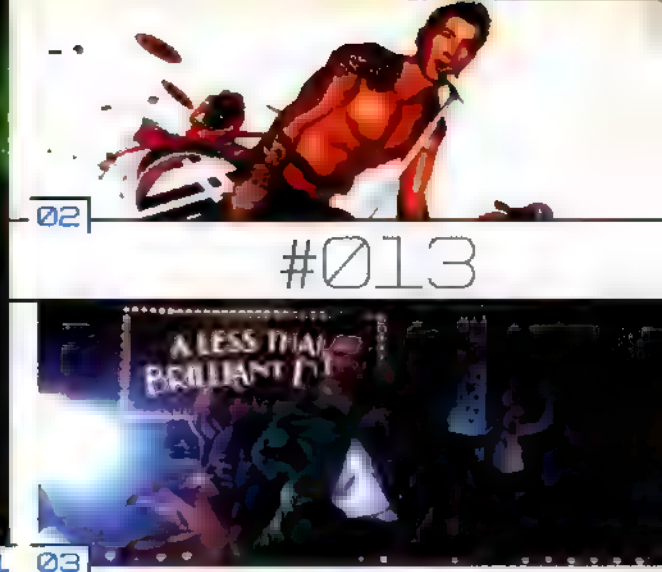
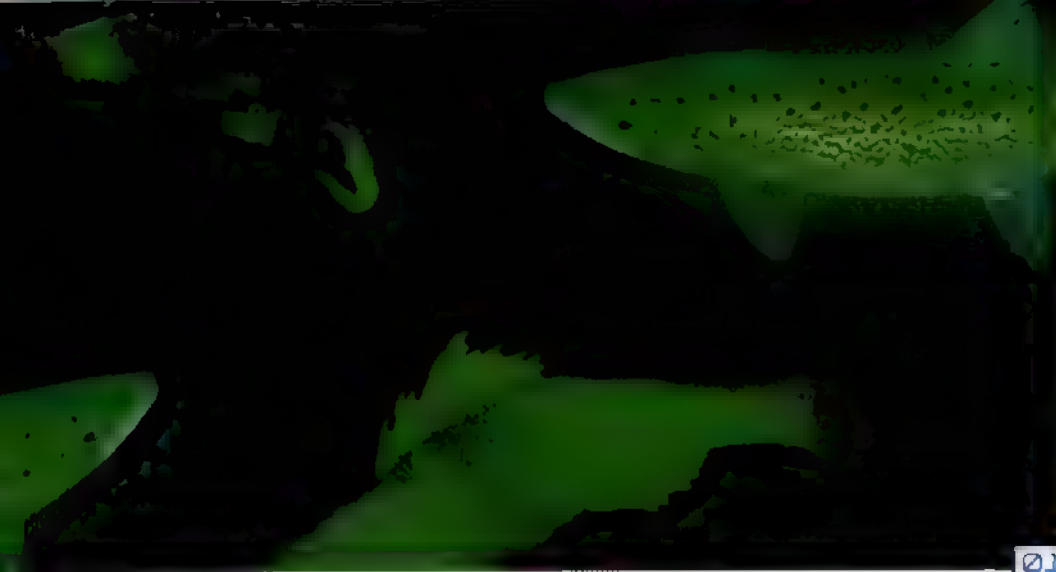
fire and smoke, the NLE applications, boast off-load rendering in the background and the ability to import PSD files directly, among other things. Meanwhile, colour grading system *lustré 2.5* now boasts a 32-bit per component processing engine, with luminance curves and an enhanced vector shape system. More information and pricing can be found at Discreet's website.



Framestore CFC rustles up some foliage footage for Johnnie Walker

The director and agency behind Framature CFC's classic *Fish* ad for Johnnie Walker have reunited for a new spot. Daniel Kleinman and agency BBH recently completed *Tree*, a moving tale of a moving tree. The minute-long ad follows a fully-grown oak as it uproots itself from a tranquil forest location and schleps its way across rivers and roads to live in the heart of the city.

Following a live-action shoot in Vancouver, the animation and compositing teams took around three months to create the effects. R&D programmer Jack Greasley designed a number of new tools for the tree modelling, including a plug-in called *FS Diversity*. Ironically, it was the final static shot which caused most problems, as the original footage included massive lens flare. *Inferno* artist William Bartlett had to completely remove it and then add virtual flare to interact with the virtual tree. "It's such a tranquil shot... you'd never guess how much business went into it," he says.



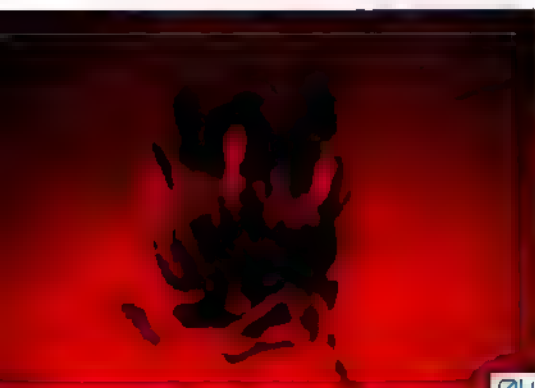
Projects round-up

There's a definite whiff of animals in this issue's projects, as fish, bunnies and monkeys (sort of) mingle with rockin' video game characters and Winston Churchill's severed head in a nice hot bubble bath...

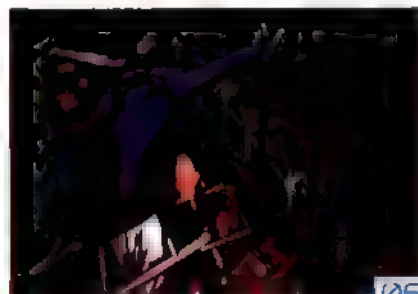
01 We begin with fish – and who wouldn't? Not real ones or CGI ones, but hulking great holographic ones created by specialists Spatial Imaging. They were designed for a sushi restaurant in the exclusive Roppongi Hills district of Tokyo, with each 75 x 50cm panel lit by laser illumination via fibre optics. Beats flock wallpaper **[1] Holographic fish by Spatial Imaging** Meanwhile, MTV2 and House of Moves have been going all cross-media with new TV show *House of Moves*. The CG-based programme uses motion derived from real performers to drive video game characters dancing to current hits. HoM provided all the motion data "The concept in *Video Mods* works because you feel like that *Need for Speed* character is really rocking out on the electric guitar" said CEO Tom Tolles. Quite **[2] MTV2 Video mods work by House of Moves** Only slightly less frenetic is the new Radox ad directed by Ben Gregor at Godman, which shows a woman enjoying a soak after a long day and imagining all her annoyances played out in the form of a musical. The Mill provided digital effects **[3] Radox ad by Godman with FX by The Mill** The credit

sequence for recent horror remake *The Grudge* also features a lot of liquid, but it ain't water. Effects house Picture Mill created a pool of bloody liquid with strands of black hair which move of their own accord. Hair and fluid dynamics were done in *Maya* and *After Effects* **[4] The Grudge title sequence by Picture Mill** Menace can also be found in an odd Korean ad for paper manufacturers DoubleA, in which a photocopy turns into a *Transformers*-like robot and hassles an understandably spooked lady. The CG was created by Kanex Opened Mind, aka Julien Vanhoenacker, using *3ds max* and *After Effects* over two months **[5] DoubleA by Kanex Opened Mind** The BBC's equally odd but much funnier satirical animated series *Monkey Dust* is back for a third go, with plenty of 3D sketches. Luke Carpenter of animation house Itchyteeth says: "In series three, which has just wrapped, we've done an eight-minute 3D and *2.5D* with cel-shaded 3D locations and 2D *Flash* characters." **[6] Monkey Dust sketch by Itchyteeth** Back to the cute 'n' fluffy with now French film *Double zéro*, an animated spy spoof featuring a hybrid white bunny. la maison created the sequence in *XSI*, along with 250 other shots. "We created our own set of

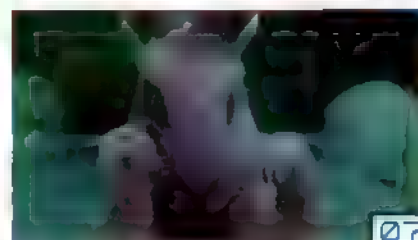
shaders specifically for our rabbit," says Head of 3D Luc Froehlicher. "We also developed a system to cache the hairs on disk, eliminating the need to regenerate them for each pass." **[7] Double zéro effects by la maison** There's more *Softimage* wonderment in the latest Absolut vodka TV ad: a single drop of booze slides down a glass, hesitates, then takes the plunge into nothingness, symbolising something or other. Swedish artist Stefan Andersson created the drop's drop, with The Mill New York. "I used Shapo Animation, together with latitudes and some creative enveloping. It gave fantastic results and was much faster than any other way," he says **[8] Absolut ad by The Mill New York** Winston Churchill's head was used for some cutting-edge CGI in *Virtual Face*, a two-minute Discovery promo. Animators Baraka created a 3D version from old photographs. "We used a 3D plug-in for some wireframe rendering in combination with *Maya* s Paint Effects," says Baraka's Glenn Griffiths. **[9] Discovery Channel spot by Baraka** Finally, The Mill proved it would go to the ends of the earth for Landrover. A sheer drop over a layered rocky cliff was modelled in 3D, then a detailed texture map was painted on its surface **[10] Landrover ad CG by The Mill**



04
05



06



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10



NEWSDesk

» EVENT HORIZON

Book your tickets for 3D festivals and events:
Fancy an animated encounter in Bristol?



2-6 DECEMBER, LONDON, UK

Go to www.cgifestival.com for the current list of two 3D Festival events. You can read the show report from the Leeds festival on page 21 to whet your appetite. And if you've not got this issue in time, you might just be able to make it... don't miss out!

www.cgifestival.com



31 JAN-4 FEB, MIDDLESBROUGH, UK

This festival focuses on the creative side of the animation business, aimed at the creative side of the animation business, aimed at the creative side of the animation business. This year the showrunners include a two-day Game Jam as well as the usual mix of talks and awards.

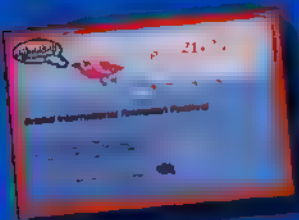
www.animationfest.org



2-5 FEB 2006, MONTE CARLO, MONACO

Imaginex is a leading event in the animation industry, having been running for a staggering 20 years. Head to the busy Monte Carlo for a show focusing on digital and traditional animation.

www.imagine.mc



21-24 APRIL 2006, BRISTOL, UK

After a superb two-year run in London, the festival returns to Bristol with screenings of the best new work, an industry day and numerous special events. The show will also be a celebration towards the Golden D'Oz Awards.

www.animated-encounters.org.uk

» PLAN AHEAD

3-11 DECEMBER, MADRID, SPAIN

A festival setting to foster film and audiovisual arts by promoting independent animation production with an emphasis on animation work from many Hispanic countries.

www.animadrid.com

31 JAN-4 FEB, MIDDLESBROUGH, UK

This international Student Animation Festival recognises student work globally. New to the 2006 event will be Character Animation, Animation Skills and Movement awards.

www.studentanimationfest.org

21 APRIL-5 MAY, CALIFORNIA, USA

The Golden D'Oz Awards is the competitive section of the festival, showcasing animation and games work from more than 50 countries. The Golden D'Oz Awards is the competitive section of the festival, showcasing animation and games work from more than 50 countries.

www.goldenoz.org/festival

SNIPPETS

EDUCATIONAL

Luxology has launched an educational version of its Subdivision Surface and polygon modeling tool. The new version is identical to the existing release but may only be used for educational and student purposes. Licenses are \$49 per seat or 14 student has a 30 Grade Point Average. \$94 (We kid you not!) www.luxology.com

SOFTWARE

Inkulator is a free experimental program for creating non-photorealistic renderings from OpenGL images. In other words, it makes 3D models look like hand-drawn images. Load a 3D model, set the various parameters for ink types (including colour) and render. You can then save in a vector format. <http://inkulator.sourceforge.net>

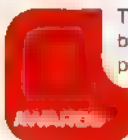
TECHNOLOGY

A new version of the hardware-accelerated final frame renderer from the graphics chip giant Nvidia. Top on the new goodies list are a revamped version of the Mango plug-in for Maya which translates most HyperShade nodes, and a fast Preview mode. Yours for \$2,750 on Windows/Linux. <http://nvidia.com>

Escape Studios has introduced a range of evening courses for Maya training covering Fur, Cloth and Hair Lools and more. Evening courses are from Tuesday to Thursday. London see the site for more info. www.escapestudios.co.uk

Escape Awards

Enter the Escape Awards to win a work placement at a top UK studio



The Escape Awards, organised by London-based training facility Escape Studios, is offering people not currently employed in 3D animation and/or post-production the chance to win a work placement at one of four world-class UK CG and games facilities.

There are four Awards categories, each sponsored by a different studio. For each, the sponsoring studio has set a challenge: a downloadable PDF entry pack at the Escape Studios website has all the details, but in brief, the Aardman Award covers character animation, or environment creation. The Mill Award covers organic modelling of a small organic real-world entity; the Lionhead Award requires the submission of elements for a game design brief, based on a Robinson Crusoe-like scenario, and the Cinesite Award requires entrants to digitally doctor a photo of an environment, to make it appear to have aged by a certain amount of time.

The closing date for entries is Friday 21 January 2006, all entrants must register online before submitting any artwork. The entry fee for the Awards is £10 (\$28, EUH23) - the one-off fee allows entrants to enter as many categories as they wish, and multiple entries to a single category are permitted. Download an Awards Pack at

www.escapestudios.co.uk/awards

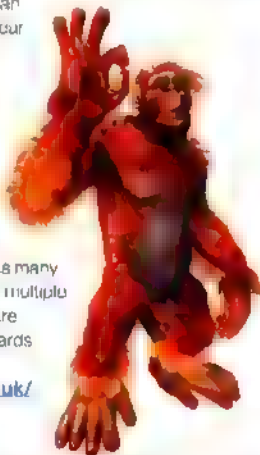


IMAGE © Lionhead Studios

Mobile winners

Mobile gaming arrives with the winner of the first 3D game contest



Gosh, the things they can do these days. The winner of the first international 3D Mobile Gaming Contest has been announced. *BUFT* a 10MB 3D game, from French developers ExKee. *BUFT* was developed by Bruno Gaiet. Production Director and Co-Founder

of ExKee. He has ten years' experience in the video games development industry and previously worked at Darkworks, Goonix Studio and Cryo.

The competition was created by Discreet and received more than 100 entries from 36 countries. "The attention to detail that went into producing the prototypes was very impressive, and bodes well for the future development of the mobile gaming sector," said Andrew Hummer, European PR manager of Nvidia, and one of the seven judges. Sponsors included Orange, Intel, IBM and Nokia. www.discreet.com

www.escapestudios.co.uk

#015

2004: a Space Odyssey

Framestore CFC creates a 3D journey to the planets for the BBC



The rather stirringly-titled *Space Odyssey: Voyage to the Planets*, which aired recently on BBC1, represented another collaboration between Impossible Pictures and Framestore CFC. The companies

also worked together on *Walking With Dinosaurs*.

The two-hour episodes of this drama/documentary follow astronauts on a six-year journey all around the solar system on a huge ship, Pegasus. The travels include various planet landings, and location shoots in Chile provided raw material for Venus and Mars environments. Zero-gravity shots were taken in a parabolic flight in Moscow. VFX Supervisor Tim Greenwood actually had to rig up a greenscreen in the aeroplane, hardly the easiest place to shoot.

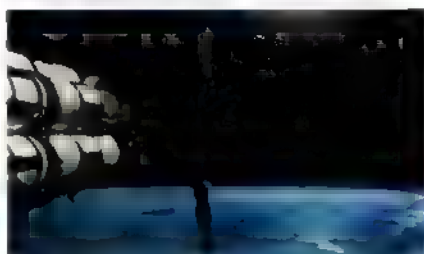
Meanwhile, Framestore CFC was surprised by the amount of work it eventually undertook: it took 235 man-days alone to create the 1km long Pegasus. "Some of the shots at the very end were logistical nightmares," says Darren Byford, Supervising TD. "You had 3D rocks, 2.5D rocks, matte painting in the

background, up to eight layers of Pegasus that had to be rendered individually and built up."

Whirlwind animations on Mars were created in Maya using volumetric particles. Meanwhile, the number of digital matte paintings needed rose from 12 to a staggering 350 by the end of the project, as development moved from pure 3D to 2.5 and 2.5D.

"We thought we were in for an easier time," said Mike Milne, Director of Computer Animation in true intrepid astronaut style. "We were wrong."

www.framestore-cfc.com



fact!

OF FREELANCERS IN THE US WHO WORK IN VFX DO NON-LINEAR EDITING WORK. DO PREVISUALISATION

Source: TrendWatch Visual Effects/Dynamic Media Report - Issue 5, Summer 2004 www.trendwatch.com

Win Addictive TV DVDs!

Addictive TV voted world's best VJs, and celebrate by giving away new DVDs



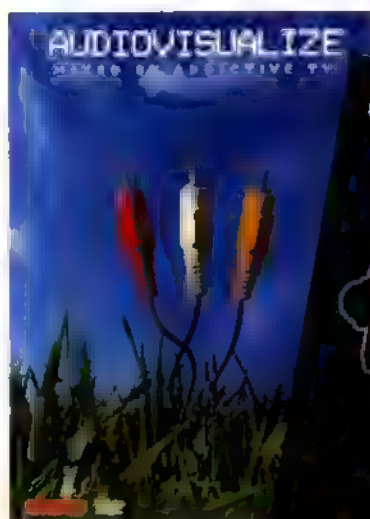
London collective Addictive TV has been voted number one in the world in *DJ Magazine's* first-ever VJ Top 20 1999 issue. (For more about the VJ

phenomenon) Addictive has performed live at venues worldwide with artists such as Fatboy Slim, 808 State and Howie B.

Now Addictive is launching two new feature-length DVDs. *Audiovisualize* and *Mixmasters Volume 1* feature The Melowtrons, Spacer, Beautiful Glimpse & Fructose, Cinderbad and many others who have worked with the likes of J2, Kraftwerk and Channel 4.

Thanks to the folks at Addictive, we've got six of these DVDs to give away in our super soaraway giveaway. For a chance of winning, just email your address and contact details to us at

3dw_competition@futurenet.co.uk including the word 'VJ' in the subject line. The first six names out of the virtual hat will receive an Addictive TV. The closing date for the competition is 1 March 2005. www.addictive.com



Enter our giveaway and you could win one of six *Audiovisualize* and *Mixmasters Volume 1* DVDs from Addictive TV. The UK-based VJ-ing collective was recently voted the world's number-one VJ-ing act.

SCIPPEST

Quick! All aboard the remake bandwagon...

From the Creative Bankruptcy Dept., classic 1980 horror flick *The Fog* is next in line for an almost certainly useless remake. Revolution Studios is taking it on, undoubtedly with a hefty dollop of CGI, and production starts in February next year. Original director John Carpenter will produce, but not direct: "I've done it once, and I don't want to do it again," he said.

Miramax is getting into the CGI animation market with the forthcoming release of *Opus*, based on the Bloom County comic strip. Further films will be produced in Brein, Inc. of San Francisco, apparently best known for an ad involving animated toe fungus. Hmm.

has entered an agreement with skateboarder Tony Hawk to produce a CG direct-to-video feature. Tentatively and bafflingly titled *Tony Hawk in Boom Boom Goes the Circus*, the film will use motion captures of Hawk and an animated version, with his voice. Production was due to start in November, with an early 2006 release pencilled in.

NEWSDesk

» ON THE WEB

Our fave five sources of 3D inspiration and advice to point your browser at this month



POWER FROM THE PIXELS

AmbientLight has released two new texture packs: *Cotswold Stone Wall* and *Green Paving Texture Pack* (£8.50) plus *Road* (£8.50) plus *Road* (£8.50). The latter can create three different surfaces and layouts. Get a 25% discount on any product by entering the code 01022210421 before checking out. Offer ends 31 December 2004. www.ambientlight.co.uk

www.ambientlight.co.uk

MISS DIGITAL WORLD

Miss Digital World has released *The Maya 6 Handbook*. The completely updated edition teaches the core of the app and the theory behind workflow, using a tutorial-based approach over a whole project. Animation is also included with tips on creating a skeletal system and rigging. Coverage of modelling skeletal deformation. \$49.95 please guys. www.missdigitalworld.com

www.missdigitalworld.com



NUDEMEN GARDEN

NuDeMen Garden is a 468-page monster on the modelling app features nine tutorials full of tips and tricks, and is designed for users of any level. \$70 to you. <http://dx.doe.com/nuudemengarden>

<http://dx.doe.com/nuudemengarden>

CARS

Clifford's Really Big Movie, Disney's Home on the Range and Teacher's Pet. Ghost in the Shell 2: Innocence, The Incredibles, *The Legend of Buddha*, *The Polar Express*, DreamWorks' duo *Shrek 2* and *Shrek Tale*, *Sky Blue* and *The Spongebob SquarePants Movie*. The nominations will be on 25 January, 2005, but it seems fairly certain *The Incredibles*, *Shrek 2* and *Shrek Tale* will all feature: and if *Polar Express* performs well at the box office. It could also make it into the running. www.oscars.org

www Pixar.com



ELEKTRA

Elektra is a 3D model of a character. It is a 3D model of a character. It is a 3D model of a character. www.elektramodel.com

www.elektramodel.com

SNIPPETS

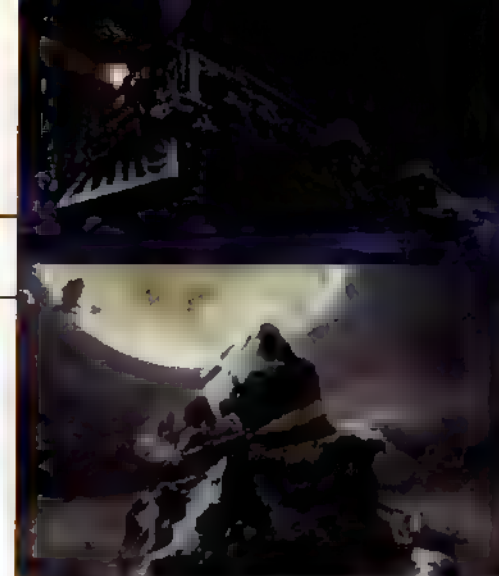
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Another new book, *SolidThinking Techniques*, is a 468-page monster on the modelling app features nine tutorials full of tips and tricks, and is designed for users of any level. \$70 to you. www.solidthinking.com

And over in the US, the BBC's JS election special on 2 November features the technology from Nvidia to power its various graphic effects and data treatments. The Beeb developed a real-time virtual set in conjunction with RT software, which was dynamically updated. www.nvidia.com



The BIG screen

IMAX blows up the Polar Express to create the first all-CGI IMAX movie

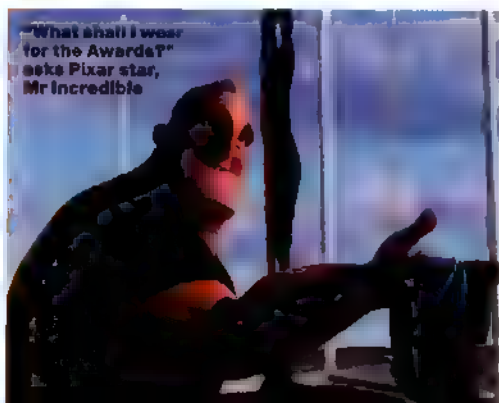
IMAX has created the first 3D all-CGI IMAX feature: a specially-formatted version of *The Polar Express*. The film, directed by Robert Zemeckis, is based on a districtively drawn and popular US children's book by Chris Van Allsburg and stars Tom Hanks. At least a virtual Tom Hanks whose movements were motion-captured using a new system called ImageMotion (see last issue for details). Hanks play five roles in the film, including several children with facial movements also captured (the *New York Times* reported "As Mr Zemeckis pointed out, he also eliminated the risk and bother of working with child actors.") The 3D IMAX version of *Polar Express* was released on the same day as the normal cinema version in more than 70 cinemas worldwide, making it the widest IMAX release ever. The DMR conversion process to IMAX was simplified by the original digital data already being in 3D. www.imax.com

OSCAR LINE-UP

11 animated films do battle for the Academy Awards animation crown

Next year's 78th Academy Awards (or Oscars, to give them the familiar term) are shaping up to be a real battleground for animated films. 11 films have been announced as eligible to compete in the Short Films and Feature Animation category by the Academy. They are: *Clifford's Really Big Movie*, Disney's *Home on the Range* and *Teacher's Pet*, *Ghost in the Shell 2: Innocence*, *The Incredibles*,

The Legend of Buddha, *The Polar Express*, DreamWorks' duo *Shrek 2* and *Shrek Tale*, *Sky Blue* and *The Spongebob SquarePants Movie*. The nominations will be on 25 January, 2005, but it seems fairly certain *The Incredibles*, *Shrek 2* and *Shrek Tale* will all feature: and if *Polar Express* performs well at the box office. It could also make it into the running. www.oscars.org



Maxwell renderer ships

A new architectural renderer from Next Limit

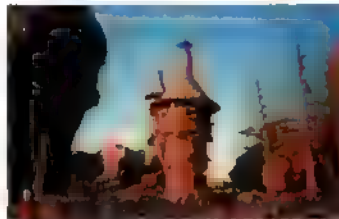


Next Limit, the creator of *RealFlow*, has announced a new standalone rendering system called *Maxwell*. The company claims that its rendering technology is based on the physics of light transport, treating light internally as a wave, then converting results to any arbitrary format. This, it says, enables *Maxwell* to produce incredibly realistic results. Unlike previous GI/light-based renderers, there are very few parameters to tweak

instead, users specify the amount of time to spend processing each render, and *Maxwell* automatically optimises itself to suit, while producing the best result possible. An alpha version of the command line *Maxwell* is available now, with Windows, Mac OS X and Linux versions to follow soon.

These will include plugin connections to *3ds max* and *Maya*. The alpha version costs \$395, with the final release (set for June 2005) at \$995. Look out for a full review of *Maxwell* in a future issue of *3D World* soon.

www.maxwellrender.com



Muscle TK to the max

CG Toolkit's Maya plug-in lets you flex your 3D pecs



Not only do the people at CG Toolkit bring you a new muscle and skinning system for *Maya*, they show you how to use it – properly. *Muscle TK*

enables artists to give creatures realistic musculature with two different methods of attaching skin. Said skin can then slide over the muscle surfaces, which are driven by underlying *Maya* joints.

Meanwhile, a muscle deformer provides a quick way to create fleshy body parts (ugh) that squash-and-stretch properly, without the usual hassle of influence objects and the like. If all that sounds a tad complicated, you'll be wanting *The Making of Leon*. This three DVD box set shows the

process of creating a film-quality digital creature, from clay statuette to fully rigged animation model in *Maya 6*. There's more than ten hours of footage, plus the full commercial version of *Muscle TK* included.

Muscle TK for *Maya 5*, 6 is \$99, while *The Making of Leon* is yours for \$149. www.cgtoolkit.com



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» CINEMATICS

Warhammer 40,000: Dawn Of War cinematic

Dave Wilson, CG Supervisor at Blur Studio, discusses the creation of the explosively filmic – and blood-drenched – intro sequence for the latest Warhammer videogame

Real-time video game 3D has improved at a rapid rate over the years, to the extent that many beloved pre-game cinematics were on their way out. However, scene-setting pre-rendered animations haven't rested on their laurels. They too have evolved, and are now more lavish than ever. And the 90-second sequence that accompanies THQ's PC game, *Warhammer 40,000: Dawn Of War*, may well be the most impressive yet.

To create the animation, the games publisher called on Blur Studio, a facility with extensive movie and broadcast experience, as well as cinematic credits for titles such as *Return To Castle Wolfenstein*. Dave Wilson, CG Supervisor at Blur, says no two game cinematic projects are alike – not least because of the need to tailor each to available budgets and timescales. "We don't really decide whether to do a project based on the budget, though," he says. "If we were offered a load of money to produce a cinematic for a *My Little Pony* game I very much doubt we'd take it. Obviously we have to pay attention, but we try to only take on the work that excites us."

Wilson says an ideal scenario for Blur is for an open brief, but in the case of *Warhammer*, the game's developer, Relic,

had already produced a rough script and story boards.

"There's already such a strong identity, with the design of the characters and the world set in stone. We were able to quickly flesh things out, and work out which shots we'd be able to produce in the very tight time frame," Wilson says. The lack of time available did make the studio hesitate, but the project was just too cool to turn down. In the end, with a week spent on pre-production, the Blur team had just three weeks to put the

"Compare this, created in just one month, to our Rockfish short, which had just two characters and a couple of props – it shows how we've really been able to pump things up" Dave Wilson **CG SUPERVISOR, BLUR STUDIO**

90-second sequence together. With more than 30 people working on the project in total, the final animation was delivered just days before the game itself reached gold-seller status.

FUTURE MICKEY MOUSE WARFARE

Wilson says it's the character designs that really give the *Warhammer 40K* universe its visual appeal. "One of the analogies Games Workshop used is that the Space Marines are to the 40K universe what Mickey Mouse is to Disney, so we'd go right down to the finest details and make sure the design stayed true to theirs."

For some of the wider shots, Blur was able to use modified versions of the in-game models and textures, though the studio built and textured far more detailed models for characters closer to the camera. Where Relic's models are composed of

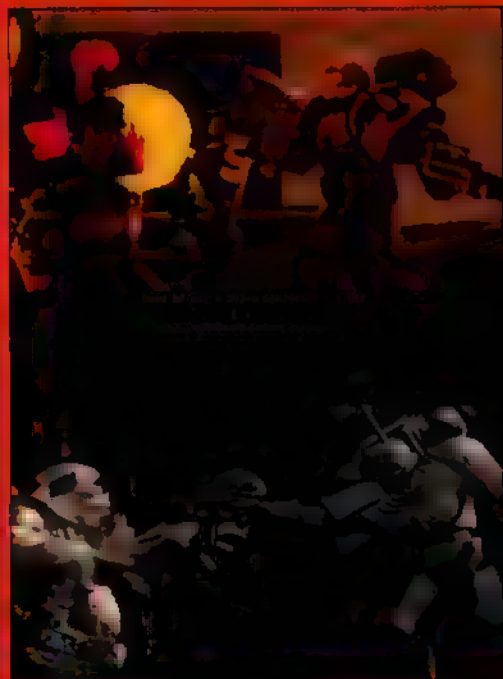


A still from Blur Studio's stunning cinematic for THQ's *Warhammer 40,000: Dawn of War* computer game. The artwork is faithfully based on the original designs created by tabletop game manufacturers, Games Workshop

"We're gearing up towards CG movie production," says Blur Studio's Dave Wilson. "Warhammer was great in that respect, helping to expose holes in our pipeline that might otherwise have gone unnoticed."

Blur worked from photographic reference, building up layer upon layer of detail with custom painting





MAKING LIGHT OF WARFARE

David Wilson, CG Supervisor for the Warhammer 40,000 Dawn Of War game cinematic, discusses the rendering features used by Blur Studio.

At Blur Studio, we were up to rendering and animating with *Blender* for rendering digital assets for compositing, plus a whole host of custom tools. We were constantly juggling out between *Blender* and *After Effects* for the final output. We had a lot of custom tools, so we really brought all this little tricks and other tools into the cinematic. There were a lot of custom tools, which provided the speed and efficiency necessary to show metallic and wet elements, followed by a key pass for the direct sunlight. Then came all the other stuff, such as emissive and lens flares, and some cinematic lighting.

For the *Dawn Of War* cinematic, we were able to bring in a lot of custom tools. We just got a lot of custom tools, as we develop new features, new shaders and better ways to render the lighting. It now makes a lot of sense to bring in a lot of custom tools, and together with the *Blender* rendering, really helps get the light into the scene. Of course, it's not just about the tools, it's about the art. We have a lot of custom tools, and we have a lot of custom tools. We have a lot of custom tools, and we have a lot of custom tools. We have a lot of custom tools, and we have a lot of custom tools.

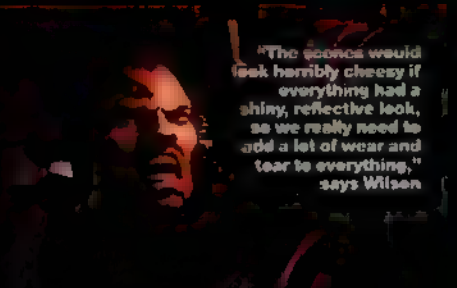
around 6,000 polys. Blur's are built using 80,000, rising to a monstrous 300,000 with MoshSmoothing applied.

While the Space Marines' signature armour plating helped simplify character animation issues, it did give rise to problems with interpenetration. "We had to come up with a compromise, remaining true to the character design while also making it functional. Really, though, that was the only complex rigging issue. We've done some crazy ones over the years, so our custom-rigging pipeline is pretty well oiled."

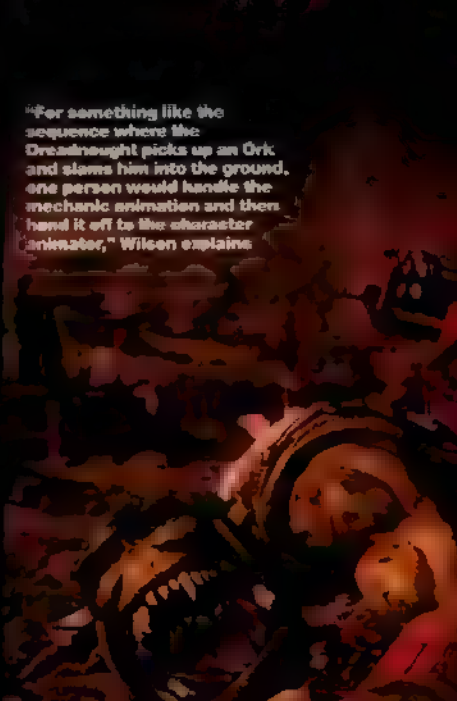
With the cinematic depiction, a violent battle between the Warhammer Space Marines and an army of Orks, the sequence relies on extensive effects work as much as characters to drive the drama. A team of eight focused solely on this area. Individual animators handled elements such as muzzle flashes, bullet tracers, and blood, while a team of three worked on the flurry of dust blasts and explosions. "They were generally created using particle systems to generate the path and motion, with *After Burn* used for the volumetrics," says Wilson. "Our guys are used to creating effects on a tight turnaround, so they've developed a lot of tricks to use at the compositing stage."

Wilson reveals that the studio has been steadily building a suite of such tools, enabling them to create ever-more complex animation while ensuring the focus remains on good storytelling and art direction. "Basically, it's all gearing towards longer projects. Blur's got to be one of the best CG features, and after working on this cinematic and getting such an amazing response, a Warhammer movie is one of the projects we're hoping will get the go-ahead. There's so much content to create a movie from. There was only so much we could do in a 90-second cinematic, but the possibilities for a feature-length movie would be amazing."

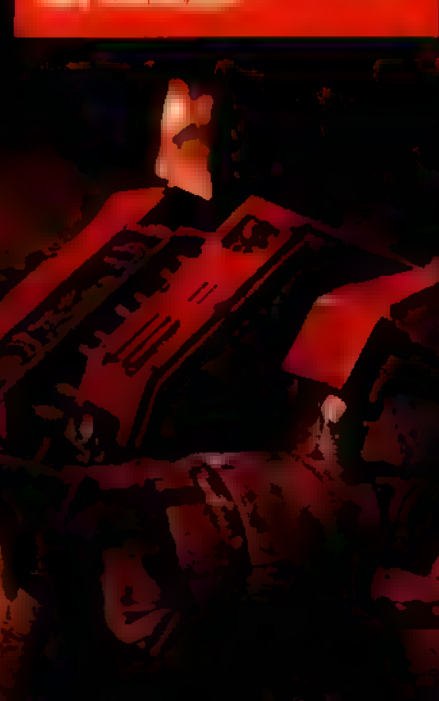
Warhammer 40,000: Dawn Of War is out now for PC. For a demo (with the cinematic) see www.dawnofwargame.com. Find out more info about Blur Studio at: www.blur.com



"The scenes would look horribly cheesy if everything had a shiny, reflective look, so we really need to add a lot of wear and tear to everything," says Wilson



"For something like the sequence where the Dreadnought picks up an Ork and slams him into the ground, one person would handle the mechanic animation and then hand it off to the character animator," Wilson explains



NEWS FOCUS

Speed painting

The concept artwork for Ubisoft's *Prince of Persia Warrior Within* was created 100% digitally. Is this the end of the line for pencil and paper in games design?



According to Ubisoft, Speed painting – the new technique it used to create the concept art for its recent PC and console game, *Prince of Persia Warrior Within* (POPWW) – is a good thing for games designers. Because it involves creating all concept art for game scenes, environments and characters entirely inside a 2D package, the need to shuttle between paper sketch, scanner and 2D software is eliminated, saving an appreciable amount of time. Plus, the logic runs working entirely on the computer means concept designers can develop their illustrations directly in colour – a big advantage in terms of the information given to a 3D artist, when compared to a black-and-white design sketch.

According to Nicolas Bouvier, Illustrator-Designer for POPWW, Speed painting is increasingly becoming a necessity for games companies. "Using traditional paints is becoming virtually impossible during game production, because – in timetabling terms – production simply can't go ahead if only one colour design is produced per week," Bouvier says. "Working digitally you sometimes need only two hours to complete a design that's useful for production." Bouvier adds that on POPWW, Speed painting enables images to be created three times faster than with traditional methods, and that Ubisoft is actively hiring more illustrators, across the board, who are versed in the technique.

PRINCE'S NEW CLOTHES?

But is it genuinely a new concept? "Speed painting is more of a term we've coined for the style of painting. There are many art forums that have talked about the style for three years now. I guess the fact is that no one has tried to put any commercial aspect on it before," Bouvier says, citing Craig Mullins and

John Knoll from Hawaii as the pioneers of the technique in the early '90s. Bouvier now sees evidence of the principle behind the technique evolving and spreading to other sectors of 3D – perhaps storyboarding and pre-viz for special effects sequences in films may be next to benefit.

"You already have similar tools coming to the 3D scene. Speed 3D sessions are already organised on 3D forums – and it's growing. ZBrush, for example, is a modelling program that fits this sort of use. It's the 2D and 3D tools that have been allowing these



"Traditional concept designers do still exist in the game industry – but they are now a minority"

Nicolas Bouvier, ILLUSTRATOR-DESIGNER, UBISOFT

artistic mutations and improvements." So which particular artistic skills should aspiring Speed painters looking to work in the games industry develop? "An aspiring Speed painter should be able to retranslate reality, and understand how light works in imagery," Bouvier says. "Of course, any Speed painter should also have a grasp of traditional concept design. The best concept designers today are those who have a strong traditional art education."

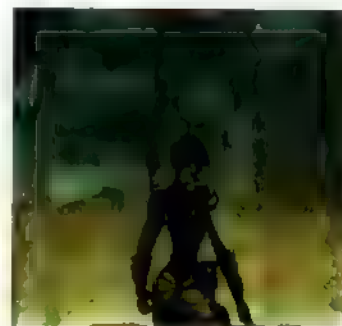
It would seem, then, that the days of the traditional concept artist are numbered, or at the very least, that the role will need to change beyond all recognition. Bouvier's view is. "A few years ago, using traditional techniques was time consuming, and so didn't really work for the fast-paced games industry. Using acrylics and traditional painting materials is fine for general illustration, but it was a pain to adapt such a system to a modern development studio. Traditional concept designers do still exist in the game industry – but they are now a minority. However, creating concepts in a traditional manner is still valuable in certain situations."

www.ubisoft.com



Does Speed painting, Ubisoft's all-digital technique for concept art, represent a new dawn for the way game developers approach their designs?

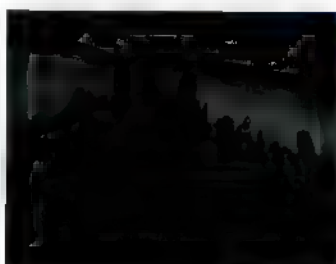
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Speed painting was used by Ubisoft to create characters as well as environments for *Prince of Persia Warrior Within*



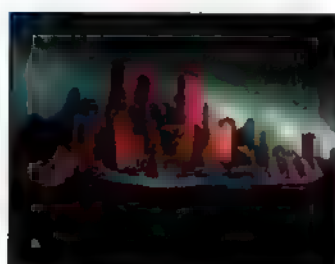
IMAGES © UBISOFT



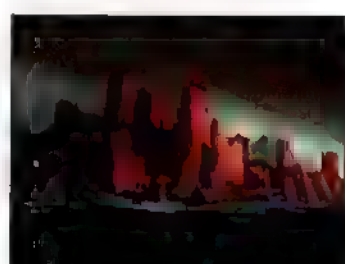
1 Ubisoft's Nicolas Bouvier walks us through the creation of concept art for an island scene, using the 100% digital Speed painting technique used extensively by the company on its PC and console title *Prince of Persia Warrior Within*.



2 Here's a study of the island, providing a global view. The first stage is to find the right shapes to determine the overall outline of the island, with the cliffs in the foreground supporting the towers of this fortified oriental town.



3 The first lines are always very loose, because artists have to find the right shapes while allowing their hand to move freely, without excessive constraints, giving free rein to the involuntary shapes that appear and stimulate the imagination.



4 The first stages are therefore developed using few colours. Initially, it's all about the shape of the composition, and the contrast.

MINORITY REPORT

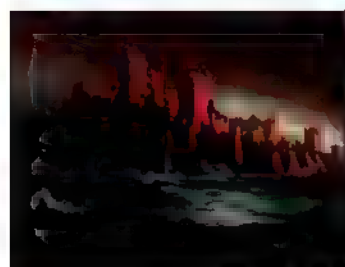
Is Speed painting really going to revolutionise the Concept Artist? Not everyone is convinced!

Concept Artist Lee Garbett comments: "I've used a lot of digital tools to create concept design using Photoshop / Painter (or similar digital apps) but I don't think they will ever totally replace pencil and paper. I've noticed the concept of digital concept design is not necessarily a good thing. 'I tend to work from a brief or brainstorming session and sketch ideas down as they come. It's a fast and efficient way of working. I find it's a much more natural approach and I can get ideas down much faster. I don't think I'll ever move forward to a digital-only process at this stage in my career.'

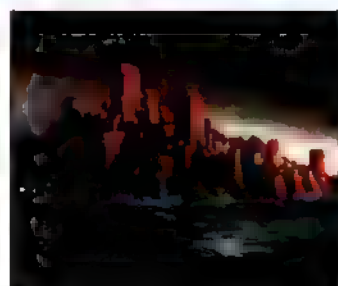
Garbett continues that creating digital concept art has its own challenges or drawbacks by going through the digital process. "However, for more intricate work such as character design or scenery I find Photoshop too sluggish in comparison to hand-drawn. There's a slight delay with the brush tool that doesn't feel as natural or fluid as pen and paper. There are also a lot of things that offer this facility, such as Corel Painter, which is a software with a good brush tool. It's not as fast as Photoshop but it's ideal for the more detailed work."

For Garbett, the notion that going digital will revolutionise the concept artist's workflow is a bit of a stretch. "I don't think it would give you any better results overall. The time spent creating is really reduced, so you're just using Photoshop instead of paper. The work still has to be done; the only real time saved is at the end, which, I imagine, would be negligible," he says. "I'd hate to think that people don't draw on paper anymore. People really love these things."

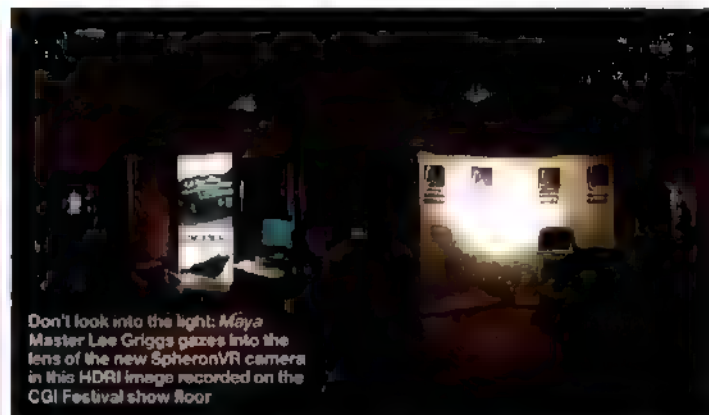
www.lee-garbett.com



5 At a later stage, the 'detail' can be added. This is where colour comes in. In this particular case, it's important for the areas around the fortress to be well-defined, as this is the first place a player will visualise.



6 At the very end, the image has more atmosphere: several layers of clouds are added, and areas of warm colour (red, and orange) enhance the fiendish appearance and mystique of the location.



Don't look into the light: Master Lee Griggs gazes into the lens of the new SpheronVR camera in this HDRI image recorded on the CGI Festival show floor

CGI Festival show report

The northern leg of the UK show features crowds, demo reel surgery – and an end to chrome balls



A revolutionary new HDRI camera that could render chrome-ball lighting data obsolete made its UK debut at the northern leg of the CGI Festival last month. The SpheronVR camera, first shown at SIGGRAPH this

year, automatically generates a 360-degree panorama of its surroundings, capturing 28 exposure brackets at a resolution of up to 13K in around a minute. The process is faster and more accurate than the conventional method of capturing on-set lighting data by photographing a chrome sphere and stitching the resulting images together by hand.

ART VPS, the company responsible for marketing the product in the UK, claimed to have received over 25 rental enquiries from major studios during the first day of the show alone. Jim Radford, Creative Lead of 3D at the Moving Picture Company, said that the studio was evaluating the camera, but that the unit's £30,000 price tag could be a barrier to buying outright. "It's a clean and efficient way of doing things, but it remains to be seen if it's cost effective," he said.



An overseas visitor to the show checks out the ART VPS stand. The robot was dropped into the scene using the on-set lighting data captured above

THE SHOWS MUST GO ON

The UK's first dedicated 3D industry event for two years, CGI Festival, also featured product demonstrations from leading developers, including Discreet, Maxon and Sirimage, and a programme of well-attended conference sessions. Highlights of the first day included the MPC's session on its crowd simulation work for *Troy* (see issue 54 for our feature), and a lively presentation on the fundamentals of videogame animation by Robert Coddington, Lead Animator, Electronic Arts.

Other presentations included a session on producing better showreels, hosted by DreamWorks' Shelley Page (see our feature on page 36) and a masterclass from The Mill's Jordi Bares on artificial intelligence for crowd animation.

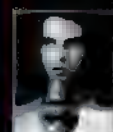
The exhibition floor was quieter, with 650 show attendees in two days – some exhibitors described traffic as "disappointing". Event Director Kevin Marnott told *3D World* that it was too early to say whether the show would be returning to Leeds next year, but confirmed that he was considering Manchester as a possible alternative.

With 1,000 attendees forecast for the London leg of the show, exhibitors remained committed to the idea of a dedicated show for the UK 3D community. "The industry needs an event like this," said Discreet's Nick Manning. "But getting people to leave their offices is challenging. More commercial companies need to support shows like this."

www.cgifestival.com

EVAN CAGLE

Following last issue's *Made in Japan* feature, first-time Director Evan Cagle reveals why he's going to steer clear of Hollywood's rehashing of anime tropes for his animated short, *Honey*



"What is anime? Is it big eyes? Is it giant sweat drops? Is it huge robots, pulsing forehead veins, high-pitched schoolgirls, bad guys with purple hair, the yatta! victory sign, spiky hair, rose petals like rain, dragon ladies?" Evan Cagle, Director, *Honey*



Evan Cagle is the creator of *Honey*, an anime-influenced short film about 14-year-old Christopher Perry who has lived for years in the shadow of his father's disappearance. His mother yearns to leave the seaside town where they live, having come to terms with the fact that Dr Perry will never return. But to Christopher's acquaintance with a mysterious beekeeper that lets him see the world in a new way.

3D: On AnimWatch, you mentioned your: "Unhappiness with the slavish rehashing of anime tropes many American productions have hurried to commit." What did you mean?

EC: Imitation is not a punishable offence, a lack of imagination is. To imitate a style that you find appealing is natural, but these meetings where execs talk about the kind of look and feel they'd like for their show don't start with: "How do we make this good entertainment?" They start with "What's hot now? What will sell?" and end with "What will be cheap?" But before anyone thinks I'm an exec basher, I want to point out that many American creators themselves typically don't have more than a passing crush on anime. They bring no unique sensibility to the artform and are happy to ape the look.

If these studios are inclined to use anime stylings in their poorly written, poorly drawn, emotionless cartoons, they first

have to answer for that lack of quality. Then we can move on to the aesthetic and stylistic effrontery. So many people grew up associating cartoons with the tired storytelling and lacklustre artwork that Japan so easily and energetically runs rings around. I wonder how it's possible creators today find then selves back at square one. A new *Scoby-Doo* would absolutely get greenlighted if it came back with three-tone shadows and highlights and, to me, that says something really important about what we think anime is or isn't.

Is it big eyes? Is it giant sweat drops? Is it manga motion lines? Is it giant robots, high pitched schoolgirls, narrow-eyed bad guys with purple hair, outrageously skimpy outfits, fey heroes, pulsing forehead veins, the 'Yatta!' victory sign, facial tattoos, tentacle rape, spiky hair, feathers and rose petals like rain, reserved but deadly samurai, amorous dragon ladies? Where do you stop? You can't just treat this art form like a popularity recipe. And if you do, Japanese animators will have already moved on to new territory, into new tropes, and you'll be left floundering with their hand-me-downs. Eventually, your audience will tire of it, while their cartoon culture flourishes. Welcome to the reason ripping off brilliant people is a crap idea.

3D: So how does *Honey* avoid these clichés?

EC: Firstly, there's the cliché of anime style – the visual aesthetic, particularly in character designs, and I guess I have no defence here – my character designs look more like *Speedracer* than *Superman*. Then there are the situational or dramatic clichés and I get around them by not using them. It's never been my intention to use my work as a vehicle for reminding people of the anime flavour, they're already familiar with. Many cartoons now act a lot like Tarantino films – a hodgepodge of well-labelled influences and an anthropological need to reference pop culture so everyone's included.

Before *Akira* detonated people's notions of cartoons, I asked about anime I could be assured of a response like "Oh yeah,

they all look like *Speedracer*." Later, in more enlightened company, I could count on "You mean like *Robotoch!*?" We've gone from anime as an American subculture to selling *Shonen Jump* at 7-11 convenience stores and, although that may mean it's now a part of our popular culture, my relationship to anime and manga wasn't born at Suncoast. Video chains don't add an anime flavour to my work, it's what I grew up with, it's how I draw – and most importantly, whenover I imagine characters and situations, it's the language I use. If people misinterpret the anime influence in *Honey*, I hope they expect another American rip-off and are pleasantly surprised.

3D: What part does 3D play in your production process, and what software/renderer do you use, for which techniques?

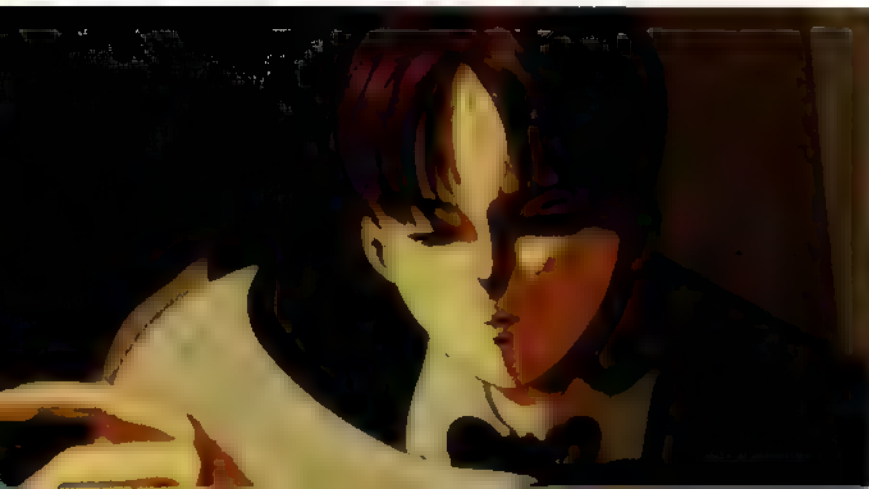
EC: 3D is important for continuity and speed. If I can draw or paint a stone-pattern texture once and apply it to multiple elements, I've saved myself many hours that could be better spent on character animation. Because I'm not interested in photorealism (and because I use 3D modelling mostly for architecture), I don't need anything more than *3ds max* and *Illustrator* to get a look I like. I also occasionally use *Paint Effects* for grass.

3D: How do you plan to expand *Honey*? When and where can we see it?

It's far from complete but, based on animatics, *Honey's* running time should be about 25-30 minutes. I'm about to begin work on Richard Linklater's adaptation of Philip K. Dick's *A Scanner Darkly* that will allow me to finance *Honey* to completion. Time and again my partner and I find it ourselves, make it ourselves and then distribute it through the website. Guys like Timothy Albee and Brian Taylor are proving the model for a microstudio is valid and yields an exceptional personal vision which can pay, market, and distribute itself. www.evancagle.com

THIS PAGE

Stills from creator/animator Evan Cagle's debut short film, *Honey*. The film is a work-in-progress with cultured anime influences, a genre and a topic its director evidently feels strongly about...





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CLOSE UP

HONDA 'GRRR' AD

Nexus Animation explains how fluffy animals and a catchy soundtrack helped create a highly imaginative ad to herald the arrival of Honda's new diesel engine

BY MARK RAMTHAW

Probably the most striking ad in recent memory CG or otherwise, the new spot created for Honda at Shoreditch-based Nexus Animation is a riot of a colour and cuteness, set against a hum along song which praises the value of hate and its role in the development of the new, cleaner Diesel engine.

Nexus' Co-Director, Alan Smith, reveals that this song was key to the whole project: "The agency creatives wrote and recorded it, and even sang it to us in a meeting after pitching it to Honda in the same way. When you've got a song that strong, it really helps you to create the animation."

The ad seems influenced by '60s pop art cartoon animations and Terry Gilliam's cut-and-paste oddities. But Smith says they actually draw inspiration from golf courses, theme parks and other 'unreal landscapes', where things are beautified but not quite natural. "We also took inspiration from those old Chinese Maoist propaganda posters – the 'all working together for the greater good', type of thing."

The agency wanted the ad to possess a smoothly flowing style. "We followed that specification up to a point," says Smith. "The first shot of the advert is over 30 seconds long, which made it a nightmare for rendering. We couldn't see the finished sequence until just before we delivered it. For the middle section we went for a more graphic, cut and paste style, before a long shot at the end again."

Darren Price is Head Of 3D at Nexus Animation, and worked with a team of 16 on the advert, including ten dedicated 3D modellers and animators. "We began with a pretty short schedule, so we put together a pretty large team," he explains. "The project grew as it progressed, though, and it eventually went from seven weeks to 12."

The team split into small groups in order to handle the three distinct sections of the ad. A fourth team focused solely on the diesel engines themselves: "They looked at getting them all

looking and moving differently, so that each engine chugged and puffed in its own unique way. The engines are all on screen for the duration of the ad so we really needed to refine them."

The agency was naturally very particular about the engines design, so Nexus began working on the look right at the pitching stage. "They wanted them to look like genuine old Honda diesel designs, so we took some reference photos of one and built a model that looked fairly similar," says Price. "From there, we took a few liberties, creating ones with bigger fans and other tweaks to give each of the engines a little more character. The smoke was added using some simple 3D particles, with some solid crusty bits near the middle of the cloud and more transparent ones around the edges."

HATE SOMETHING, CHANGE SOMETHING

The engines were a worry to the team as they had to be depicted as outdated without showing Honda in a bad light. "We wanted to make them stinky, but not too horrible," he says. "Once we got to the shots featuring the new engine, we hadn't intended to use any smoke effects at all. We thought it might be verging on false advertising, so we had to come up with 'nice smoke' that looked appealing."

3ds max was used for the modelling and animation, with Sub-D employed, and everything output through Brazil. Price believes the radiosity, sky light fills, and high-quality shadows make it the best rendering solution for 3ds max. "We didn't really push the radiosity to its limits with this project but it does help give a nice, organic glow."

The ad also makes liberal use of on-screen text. This initially creeps in as part of the main scene, with 3D text formed by a hedge, or painted onto a peacock's feathers. In the middle sequence, typefaces are laid into the shot. "Our designers had fun putting those fonts together," says Price. "Where the beginning and end parts of the ad are straight 3D renders, the graphic elements like the text, the background patterns and the other 2D elements were all added using After Effects."

"That was the good thing about this project – we were allowed to mix different styles to create a sort of collage effect," says Price. "Rather than getting bogged down with simulation software we got to do cute CG animals instead!" ■

DETAILS

Honda 'Grrr'

Wieden & Kennedy

Alan Smith and
Adam Foulkes

30 seconds

2 October

www.nexusanimation.com

16

11 Weeks

3ds max, Brazil, Deep Paint,
Photoshop, Shag Fur

FURTHER VIEWING

www.honda.co.uk

The Honda 'Grrr' ad is showing in cinemas and on TV across the UK. You can either view it online at www.nexusanimation.com or download it from www.honda.co.uk.

THE HONDA 'GRRR' AD

The Honda 'Grrr' ad is a highly imaginative and visually striking advertisement for the new Honda Diesel engine. It features a catchy soundtrack and fluffy animals, creating a highly imaginative and visually striking advertisement. The ad is a collage of different styles, including 3D renders, graphic elements, and 2D elements. It is a highly imaginative and visually striking advertisement for the new Honda Diesel engine.



#025

PAINTIN' WABBITS

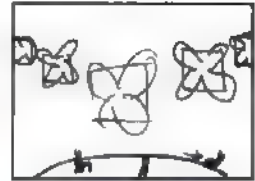
"The fur on the rabbits is painted on," says Darren Price, Head of 3D at Nexus Animation. "In most shots they're just whizzing past, so it'd be hard to see 3D fur anyway. For the grass, we used a flat procedural texture for all the backgrounds. There are a few points close to the camera where we added some *ShagFur*, and patched on a few more detail-painted textures."

TARNISHED BASE

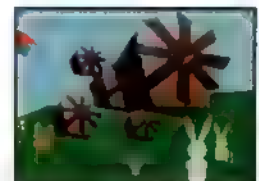
"We used the Dark Trees texture library for the engine," says Price. "This created a nicely tarnished, metal base. We added layers on top, placing specific textures like oil drips. We ended up with loads of layers, which we then baked into single textures."

SKY LIGHT

"The skies [for the Honda advert] are also all hand painted," says Price. "One of our compositors put those together. He also created all the shafts of light you see, and the framing on the clouds. We then matched this against our own 3D lighting."

**BIT OF FLUFF**

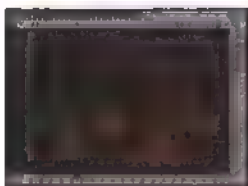
"The agency wanted to illustrate a world where positive things use hate to destroy these old engines, and then celebrate the new, cleaner engine," explains the ad's co-director, Alan Smith. "The idea was to have positive things being destructive, with flowers and fluffy animals acting quite violently."

**OUT OF THE PAN**

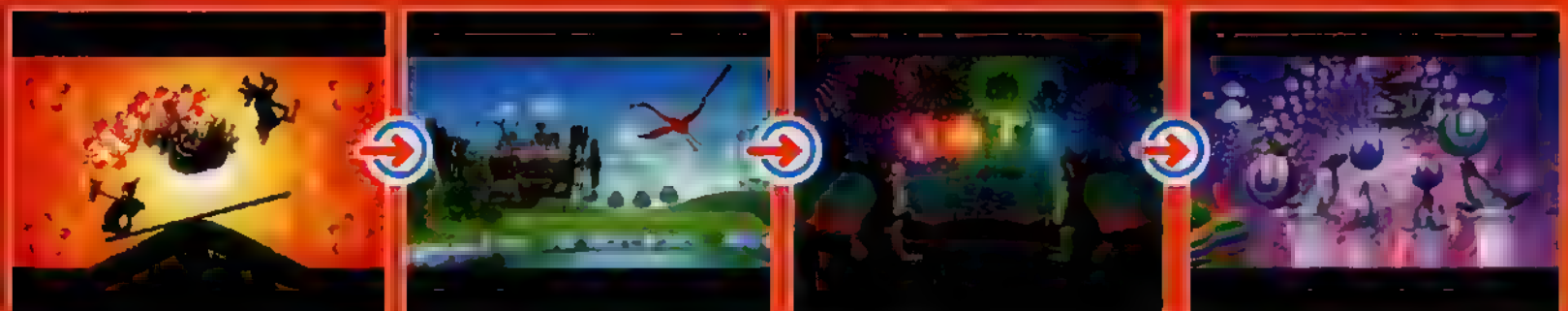
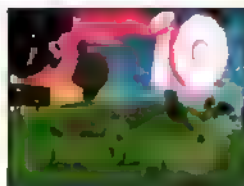
"There was much discussion about the camerawork: 'At one point we had the camera as if it seemed to be sitting on one of the flying engines,' says Smith. 'The agency preferred a simpler pan, but we were concerned that it might give it a platform game scrolling feel. We met somewhere in the middle, adding an extra dynamic with the engines sweeping in close to the camera then flying further away.'"

**RUN RABBIT RUN**

"The rabbits were the trickiest characters," says Nexus' Darren Price. "They looked great running, but then we got to the bit where they dance and it would start to look strange. Their faces are well designed, so they still look like animals."

**ABOUT FACE**

"We'd do a rough 3D animatic just using blocks, to set the camera to," says Smith. "We could then set the camera moves early on, and also start editing. The animators were then able to work independently of each other."



FEATURE

INSIDE THE INCREDIBLES

Longer and edgier than any of its previous work, Pixar's latest film benefited from a production pipeline more akin to a live-action feature. **3D World** unmasks the technology that gave *The Incredibles* its superpowers

BY BARBARA ROBERTSON

FACT FILE

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Emeryville, California 94608

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WEB

www.pixar.com

FOUNDED

1986

NO. OF EMPLOYEES

300+

SELECTED CREDITS

Toy Story (1995), *A Bug's Life* (1998), *Toy Story 2* (1999), *Monsters, Inc.* (2001), *Finding Nemo* (2003)

SELECTED AWARDS

Academy Award for Best Animated Feature Film, *Finding Nemo* (2004); Academy Award nominations for Best Animated Feature Film, *Monsters, Inc.* (2002); Academy Award nomination for Best Screenplay Written Directly For the Screen, *Toy Story* (1995); Academy Award for "Special Achievement" John Lasseter for leading the *Toy Story* team (1996); Academy Awards for Best Animated Short Film, *Tin Toy* (1988), *Bar's Game* (1997), *For the Birds* (2002); Academy Award nominations for Best Animated Short Film, *Luxo Jr.* (1987), *Tin Toy* (1988), *Mike's New Car* (2003), *Boundin'* (2004)



Two superheroes, Mr. Incredible and Frozone, practice their craft in Pixar's latest feature animation, *The Incredibles*. Artist Brad Bird's original designs for these 3D superheroes were for hand-drawn characters.

Opening to rave reviews and a box office of \$70.7 million (second only to *Shrek 2*), Pixar's *The Incredibles* secured the studio's 100 per cent success rate, with all six of its animated films reaching the top of the hit list. Usually spawning U-rated features, Pixar stepped into new territory with this PG-certified tale of a superhero family stuck in the suburbs – and it worked. *The Incredibles* had the fourth biggest premiere for a superhero movie ever, right behind *Spider-Man*, *Spider-Man 2* and *X2*.

The comparison to those live-action superhero movies is apt. Although *The Incredibles* is a CG feature, Director Brad Bird created a film with live-action attitude, plotting camera

moves on storyboards, dividing the crew into first and second units – and even 'shooting' his characters as if they were on a greenscreen stage. Although the three live-action superhero films were based on comic books and *The Incredibles* isn't, the characters' designs reflect a comic-book style, not the style many expect from Pixar. In a sense, Pixar made a Brad Bird film; Brad Bird didn't make a Pixar film.

The film follows Mr. Incredible (Craig T. Nelson) from his marriage to Elastigirl (Holly Hunter) to their downfall and subsequent move to suburbia in a Witness Protection program. The former Mr. Incredible becomes Bob Parr, office worker, and Elastigirl becomes Helen Parr, mum to daughter Violet (Sarah Vowell), son Dash (Spencer Fox), and baby Jack Jack, all of whom have superpowers. The film also stars Samuel L. Jackson as the voice of ex-superhero Frozone, played live as the White Bedroom, and Brad Bird himself as

"I KNEW MY STORY WOULD BE PROTECTED [AT PIXAR]. I COULD PUT ALL MY ENERGY INTO MAKING THE MOVIE, NOT DEFENDING THE MOVIE." Brad Bird, *interview*

FEATURE



Edna E. Mode, the family's costume designer Bird first brought the idea for *The Incredibles* to Pixar four years ago. Although a departure from its normal U-rated fare, the studio immediately got behind the project. "I knew my story would be protected," he says, "I could put all my energy into making the movie, not defending it."

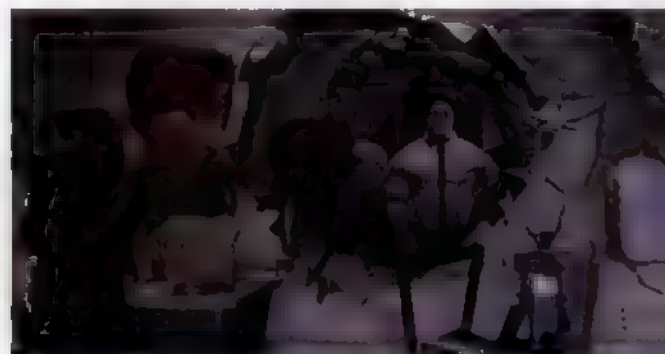
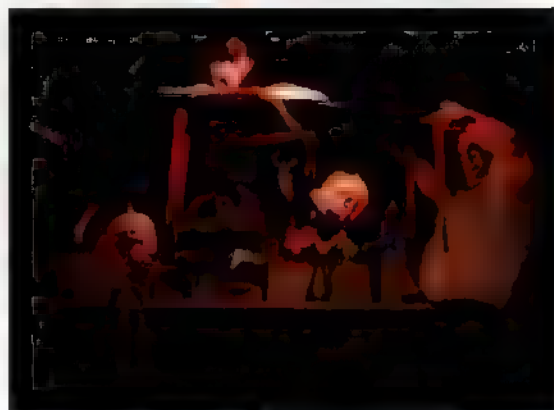
Moving with Bird to Pixar were John Walker, *The Incredibles'* producer, who had worked with Bird on *Iron Giant* at Warner Bros., and Storyboard Artists, Mark Andrew and Andrew Jimenez. "Brad loves story guys who are strong stagers," says Walker. "The storyboard is not about dialogue; it's the movie. Andy was working in *After Effects*."

At Pixar, Supervising Technical Director Rick Sayre became Bird's liaison with the studio, acting like a visual effects supervisor on a live-action film. "At the start, I worked with the director to understand the film and the production process we'd need," he says, "I looked at what kind of R&D and outside tools it would take, and then just rearranged everything. Our motto was, 'Welcome to *The Incredibles*! we're still figuring it out.'"

ABOVE AND ABOVE RIGHT After lawsuits force the superheroes into retirement, Mr. Incredible becomes Bob Parr, Insurance Agent. The fluorescent lighting in the office was one of 179 master lighting setups designed for the many locations in *The Incredibles*

RIGHT A family dinner with superheroes becomes an uplifting experience when mum (the former Elastigirl) and dad (former Mr. Incredible), use their powers to quell a squabble between the kids

FAR RIGHT Mr. Incredible fills out when he retires so the character rig had to adapt accordingly — as did the muscle and skin simulations. Twisty spines help Elastigirl reach under the couch



From the start, Sayre and the Pixar crew had their hands full. Not only did the script call for more human characters than ever created at Pixar before, but also the film was almost 15 minutes longer than any of its previous efforts. Bird's storyboard style helped out here. "The storyboards were more like live action than animation," says Sayre. "They had timing, pacing, and camera moves. So, because he had specific notions about what he wanted, the layout department had a different role to that on a conventional CG movie: they offered suggestions; they didn't invent camera moves from scratch."

Bird explains the difference: "John [Lasseter] likes to be free to move the camera anywhere he wants," he says. "He likes to play with it. I like to flesh out the idea in the story reel, to get a feeling of how it's paced early on." For example,



for *A Bug's Life*, directed by Lasseter, Pixar built an entire island and then, as Sayre puts it, "sent out location scouts" who looked for good camera angles. In contrast, the crew on *The Incredibles* team knew where the camera would be in advance, and therefore built only the models needed for

"I JUST REARRANGED EVERYTHING. OUR MOTTO WAS, 'WELCOME TO THE INCREDIBLES: WE'RE STILL FIGURING IT OUT'" Rick Sayre, SUPERVISING TECHNICAL DIRECTOR

particular shots, saving needed production time

"We wanted to make the biggest movie [Pixar had ever produced], but we didn't want it to cost more," says Bird. "The only way to do that was to know exactly where the camera was so we didn't build anything extra. If the camera moved two virtual inches to the right, the shot would have broken down."

HOLY LIVE-ACTION, BATMAN

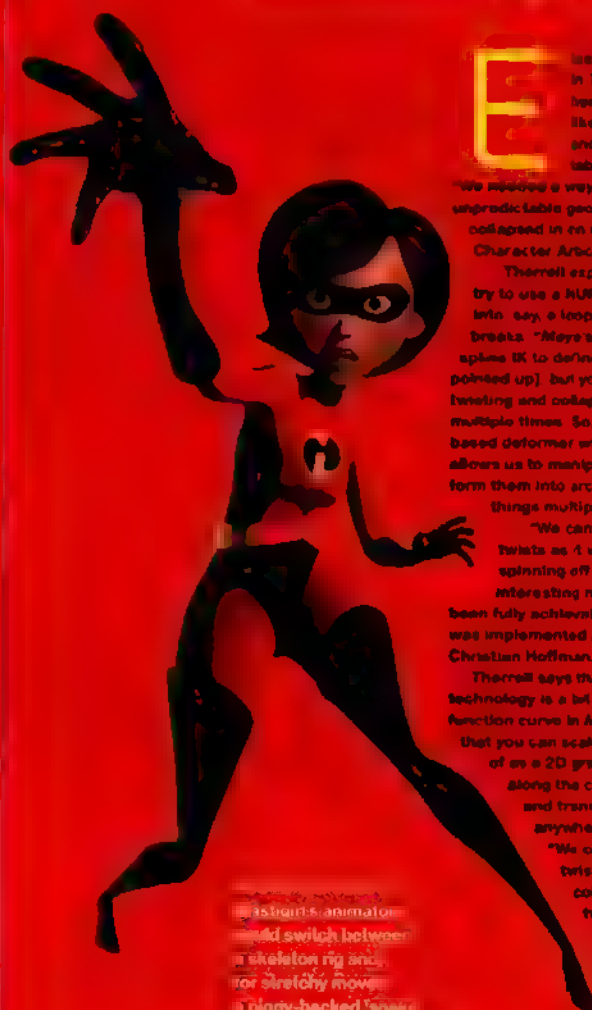
In addition to building sets from camera view only, the Pixar crew also borrowed the idea of first and second units from live-action filmmakers. First-unit teams were the animators who worked on hero characters and sets; second-unit teams comprised effects animators.

This separation of first and second units had some interesting consequences for the production pipeline. The shot during which Edna describes the new superhero suits to Helen, for example, was even staged like a live-action shot, with the animators treating the characters as if they were on a greenscreen stage. Separately, the second unit built the lab behind them and composited it into the final shot. Because the two units were working independently, they could even use entirely different software. Helen and Edna were built in *Maya*, rigged and animated using Pixar's proprietary tools, and rendered with *RenderMan*, while the stretchy suit behind the window in the lab was a 2.5D matte painting created with *3ds max* and rendered with SplutterFish's *Brazil* rendering system.

>>

TWISTY SPLINES

How Pixar's new curve deformer



Elastigirl, one of the superheroes in *The Incredibles*, can stretch her body into other forms, like parachutes and boats, and wrap her arms around tables, her children, and poles. "We needed a way of doing that without having unpredictable geometry that might have collapsed in on itself," says Mark Therrell, Character Articulation Artist.

Therrell explains that usually, when you try to use a HURBS curve to deform a surface into, say, a loop the loop, the deformation breaks. "Maya's answer to that is to use splines (K to define up vectors) [normals pointed up], but you can still have popping, twisting and collapsing if you coil geometry multiple times. So, we developed a new spline-based deformer with a stable twist vector that allows us to manipulate her arms, stretch them, form them into arcs and curves and wrap around things multiple times."

"We can define how the geometry twists as it wraps while keeping it from spinning off in strange directions. It's an interesting new concept that has never been fully achievable before." The deformer was implemented and installed by Pixar's Christian Hoffman.

Therrell says that using the new, patented technology is a bit like taking the concept of a function curve in *Maya* (with its tangent handles that you can scale and twist) into 3D instead of as a 2D graph editor. "We have tangents along the curve so we can scale, shape and translate a point on her arm anywhere in space," he says.

"We can twist it so that her arm twists down its length and never collapses, never gets small or twists into nothingness. It maintains its volume."

Therrell's new deformer is based on a skeleton rig and a piggy-backed 'snake' rig, based on Pixar's new curve deformer.



FEATURE



TOP LEFT

Subsurface Scattering helped the crew create believable humans that didn't look creepy. Soft ambient occlusion shadows helped make the characters seem like they were in the same scene together

TOP RIGHT

The characters were rigged with Pixar's proprietary software. Every character referenced one rigging template that had basic rotates at major joints

MIDDLE

Dash's superpowers allow him to move very fast, and Pixar's new bendbow technology helped to create that motion in a cartoony, Tex Avery style

FAR RIGHT

Lighting throughout the film ranges from naturalistic to theatrical depending on story points. Here, the stark lighting reflects Elastigirl's dangerous rescue mission

"It was great fun," says Sayre. "Liberating. I think every breaking tool in the world got used here and there. It was the least 'in camera' film that we've done. Usually we poke the render button and out comes the shot. [With *The Incredibles*] we poked the render button and out came a bunch of elements for compositing." For this purpose, Pixar primarily used *Shake*, with an occasional shot assembled in *After Effects*. The studio also, in Sayre's own words, "cheated like crazy." Among the cheats were (whisper it) practical effects. "We used live-action water that we filmed in a kiddie pool when the baby is in the sink," he says. "And we filmed trees to create shadows on the wall."

"When Brad first came here," Sayre adds, "he said the one thing that drove him crazy was that people built spaceships when it made more sense to throw a damn saucer." But although Bird's live-action inclination may have helped the production team cope with the ambitious project, his stylised human characters presented numerous new challenges.

"We had two opposing ideas," says Bill Wise, Character Supervisor. "The characters were cartoony in shape and proportions, but they needed to be believable as humans. And since many of them were superheroes, they had to perform in wild extremes." So not only did the characters need to have muscles, but Elastigirl needed to stretch and



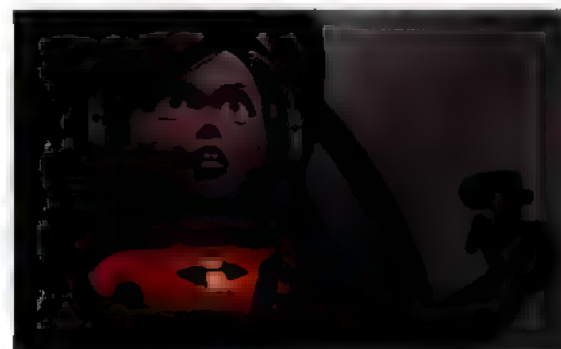
twist her arms. Bird also wanted a cartoony squash-and-stretch animation style for the other main characters. And if that wasn't had enough, there were 12 of them.

LOOP-THE-LOOPS

The characters were modelled in *Maya* and rigged using proprietary systems. "The challenge was in the rigging," says Wise. "We developed a template with basic rotates at major joints that could be applied quickly to characters so that we could easily apply musculature to them. Every character referenced the template, and changes to the template would propagate to all the characters."

All character rigs included something called 'bendbow'. "The characters could not only bend at the elbow and wrist," explains Mark Therrell, Character Articulation Artist, "but we could take the angle and smooth it; shape it into an arc or a curve. When an arm is moving through a fast arc, instead of motion blur, which is a fake arc of colour, the animators actually shaped the character into the arcs." Thus, the animators could exaggerate the characters' motion using a graphic, Tex Avery kind of style.

For Elastigirl, who needed extreme bending and stretching, a special rig based on a new curve deformer [see p. 29] allowed animators to shape her arms into arcs, curves, zigzags or loop-the-loops. Because Bird wanted the audience to see the turmoil Elastigirl goes through when she decides to use her stretchy superpowers, a simple morph wouldn't do. "One of the biggest challenges for Elastigirl was that we needed an appealing attractive woman that we could articulate in a traditional way using joints, elbows,



wrist, knees, and gaily features," says Mark Therrell, Character Articulation Artist. "I then needed to figure out a way to transition this attractive human rig into a monster-like thing that still looked elegant, slender and feminine while doing something humanly impossible."

To do that, he created two rigs: The first was a normal rig that was articulated in the usual way in Pixar's proprietary animation software. The second rig was a separate 'snake' rig that used the new curve deformer with a duplicate of Elastigirl's geometry. The 'snake' duplicate was piggybacked onto the normal rig. "The curve skeleton deforms another version of Helen that you never see exactly like the real Helen minus hands, feet and head," says Therrell.

The team would animate Helen normally, like any human character and then when they wanted her to make stretchy movements, they just flipped a switch. "Suddenly, Elastigirl was doing the same thing but with a completely different rig," says Therrell. "They could take the tabs – the control points along the curve – and constrain objects and also have objects constrain to them." In addition, they could translate the tabs up and down a curve like path animation, so that her arm could snake out, for example, and wrap itself around a telephone pole.

When animators wanted Elastigirl to go back to Helen, they animated all the control point values back to zero, the control points moved back into place, riding piggy-back on the skeleton again, and the animators could then blend back to the skeleton. "It was like a magic trick," says Therrell, "they'd flip the switch when you didn't expect it."

Another 'magic trick' turned Elastigirl into a parachute. "We took the curve deformer into another dimension," says Therrell. "Instead of curves, we used flat surfaces and had a little gingerbread man-style of surface that moved with the normal Helen skeleton. So, not only could we do a chewing gum linear stretch, we could blend to a malleable 'parachute Elastigirl.'"

MUSCLES, SKIN AND HAIR

Most of the characters also needed muscles to look believable, so a musculature system was built on top of their rigs with skin that slid over the muscles. The bones moved the muscles, which were deformer objects attached to bones at two points, and the skin dragged along – a standard type



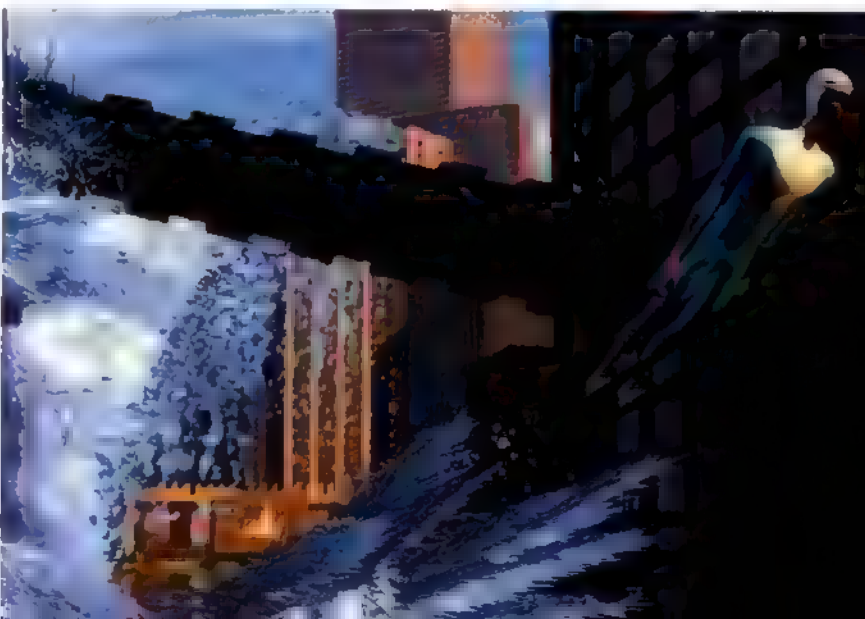
"THE CHARACTERS WERE CARTOONY IN SHAPE AND PROPORTIONS, BUT THEY NEEDED TO BE BELIEVABLE AS HUMANS. AND MANY OF THEM WERE SUPERHEROES, SO THEY HAD TO PERFORM IN WILD EXTREMES." **Bill Wise, CHARACTER SUPERVISOR**

of muscle-skin simulation system for CG characters.

Animators typically create the performance with this type of dynamic simulation, and then technical directors run the muscle and skin simulations. Pixar animators, however, wanted to see the muscles as they animated. "They didn't want to give up control of the silhouette," says Sayre.

Skin simulations don't run fast enough for animators to see the results in real time, so Software Engineer John Anderson and Pixar's tools group created an alternative method using an entirely new technique: statistical modelling. This produces a model based on data rather than geometric transforms; the shape is based on probability – a best guess inferred from previously calculated results [see p 32]. Statistical modelling also allowed animators to see how

BELOW LEFT AND RIGHT: Frozone's ice crystals were inspired by the ice in *Fantasia*. "Name the effect, we did it," says Rick Sayre, Supervising Technical Director. "We had volumetric clouds, CG fire, sprites, fluid simulations – a lot of effects on the edge of possible."





FEATURE

DATA-DRIVEN MODELS

How Pixar's animators used statistical models to create the characters' muscles, skin, and hair.

Statistical models, which use data rather than geometric transformations to produce a shape based on probability as a best guess inferred from previously calculated results—helped Pixar's animators see what the characters' muscles and clothes looked like during a performance.

"We built the character group out of 150 characters through a set of poses," asked out the reference muscles, and built out the internal coefficients," says Software Engineer John Anderson. "We used that information to build a statistical model, an internal mathematical representation of the internal coefficients."

Now animators could then see the results of a simulation without actually having to run it. The statistical model knew that often a character looks like this, the muscles don't look like that," says Rick Sayre, Supervising Technical Director. "We then use the same idea for clothes and subsurface scattering." Costumes followed for each character, scene, created and rendered on

Maya from parameters and fit on the characters. They were then put through a set of calculations. "We'd run the characters through the cloth simulation and store the results," says Bill White, Character Supervisor.

Then, as the team did with the muscles, the results of the cloth simulation for those poses were based out and used to train a statistical model. This compressed memory of what the cloth looked like was implemented in an algorithm. Once again, the crew could have the movie without running dynamic simulations. "We could see cloth moving as a character performed without having to run a simulation for that particular performance."

Statistical models were used to create the hair of the characters. "Bob's hair is very short," says Anderson. "But in every shot, it's very difficult to calculate the effects of the hair on the character's face, so we used a statistical model to create the character's hair, so we could see the character's face without having to run a simulation for that particular performance." The hair was then rendered on the character's head, so although the clothes on his body were simulated, the hair on his head was rendered on the character's head.



Internal and external forces. In addition to the pure simulation technology, we made a lot of targeting and parameter adjustments. A character's hair could be sculpted into a rest behaviour, for example, and attracted to a keyframe.

"We also worked on keeping movement coherent," says Anderson. "You can't simulate every hair but when you replace the bulk properties, the hair tends to lose coherence." This became especially important in a scene that sent Helen and Violet swimming underwater, Violet's hair flowing behind her.

Another difficulty with hair was lighting it. "The shadows created by strands of hair needed to be at full density so you could see the separation," says Janet Lucroy, Director of Photography. "But the characters had translucent shadows unless the scene was very graphic. So we handled the hair with extra fill light."

LIGHT TOUCHES

For the soft, translucent shadows themselves, the crew used ambient occlusion judiciously. "Only where we got the most bang for the buck," as Lucroy puts it. "When Helen puts her hand on Bob's arm, we get a lot of payoff."

Throughout the film, the lighting crew also used contact shadows. "Our motivation for using them for the dark line in nooks and crannies was that if two things should touch each other, it doesn't matter where the light comes from," says Sayre. "No light gets there." In each case, the lighting artist decided whether the contact shadows would be baked or computed every frame. "If Helen and Bob are facing each other, the contact shadows are computed," explains Sayre. "If the shadow is caused by a picture frame on the wall, we can bake it."

In most 2D animation, characters' eyes are brightly lit and faces are seldom in shadow. But this film had lighting that ranged from natural to theatrical. "Brad's point of reference was inspired by live action, action movies, and film noir," says Sayre. "We have strong harsh shadows on faces where we see only one eye. The lighting accentuated or toned down the graphic forms of the characters." For example, when Mr. Incredible stands in front of a wall of red lava, he's so starkly backlit that he's just a black shape. But domestic scenes such as Helen and Dash riding home from school, a family dinner, and other scenes at home were lit softly. "The lighting didn't call attention to the characters," Lucroy says.



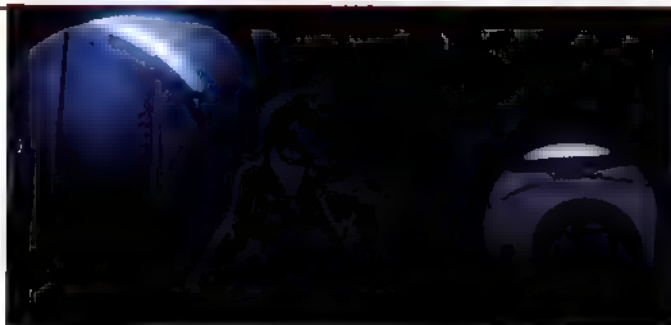
the characters' costumes looked in motion for any particular performance based on previously calculated dynamic simulations.

For cloth and hair simulations, the crew used an engine originally developed by Andrew Witkin, David Baraff, and Michael Kass to create Boo's T-Shirt and Sully's blue fur in *Munsters, Inc.* They updated it to meet the demands of *The Incredibles* by, for example, adding methods for controlling the hair simulation. "Hair was part of the characterisation," says Wise. "For example, Bob habitually runs his fingers through his hair and Violet hides behind hers. In one scene, Helen tucks Violet's hair behind her ear—a familiar motherly action and very difficult to simulate."

To solve the problem, Pixar had to dramatically redevelop its hair technology. "The core simulation did evolve," says Anderson, "but mostly we were developing new kinds of

THIS PAGE

Because the animators always wanted to see the characters' outlines, Pixar's studio tools group developed technology that made it possible to see the results of muscle and skin simulations without running the simulations.

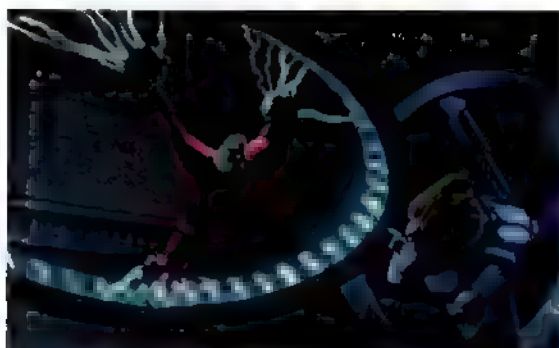


Because there were so many locations in the film, the crew devised techniques that allowed lighters to work more interactively than before. "We were in outer space, on an island, underwater, and in a city," says Bird. All told, there were 179 master lighting setups, which compares to 56 for *Monsters, Inc.*

Illumination Engineer Daniel McCoy worked on technology that would approximate final renderings quickly enough for the crew to see the lighting effects interactively. "We would render images with lighting parameters that corresponded to the surface under each pixel and then bake them out," he says. "If the surface was skin, it would have lighting parameters for skin; if it was a carpeted floor, it would have those lighting parameters."

"When a light was moved, the images would be updated with hardware rendering," he continues. "So the lighters could drag a light around and get a close approximation of the look they wanted. They could change the colour of the light, the intensity, the shape, and even reflections." Although it was designed to help lighters with master setups, the system was used for shot lighting as well. "The lighters would do the first 50 per cent interactively, and then switch."

What the system couldn't take into account, however, was Subsurface Scattering. For this, the team applied the same ideas used for muscles and cloth so that it became a fast off-line process that was informed by a statistical analysis of the character. When it came to skin, the designers were in a quandary. "The character design was difficult," says Bird. "CG looks plastic without detail, but beyond a certain point with the stylised deformed people, it starts to look creepy. So we went with less detail in the pores and more in the Subsurface Scattering."



"EVERY FREAKING TOOL THAT EXISTS GOT USED HERE AND THERE. USUALLY WE POKE THE RENDER BUTTON AND OUT COMES THE SHOT. HERE, WE POKED THE RENDER BUTTON AND OUT CAME A BUNCH OF ELEMENTS FOR COMPOSITING."

Pick Sayre, SUPERVISING TECHNICAL DIRECTOR

Pixar films typically push state-of-the-art computer graphics in new ways. *Toy Story* proved that a 3D feature film could not only be made, but it could be a smash. The short film *Ger's Game* introduced the graphics community to Subdivision Surfaces. And when Boo pushes her little hand into the fur on Sully's shoulder in *Monsters, Inc.*, Pixar demonstrated how hair simulation could make a story point.

For *The Incredibles*, Pixar solved two major problems: creating and animating oddly shaped yet believable 3D human characters in a cartoon style, and producing a film with many of these characters in every frame (and in numerous locations) without breaking the bank. Pixar's technical wizards created new tools - a spline-based deformer, statistical modelling algorithms, and a hardware-based interactive lighting tool - and the production crew adapted live-action techniques such as the concept of first unit and second unit teams. As a result, with *The Incredibles*, the studio that gave birth to CGI feature films proves that 3D animated films can now offer the creative flexibility of live-action films - given the proper tools and an inventive team. ■

THE INCREDIBLES

www.theincredibles.com

The Incredibles has already opened in the US and will be on general release in the UK from November 19. Visit the website for more info, games and downloads.

THIS PAGE

Lighting for *The Incredibles* was inspired by live action films, action movies, and film noir. Using new technology that generated images that approximated final renderings in real-time, the lighters could see the effect of changing the colour and intensity of lights, as well as the shape

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FEATURE

SHOWREELS... A DUMMY'S GUIDE

With studios receiving over 200 entries a day, getting a career in 3D is harder than ever. To wangle that dream job, you'll need to create a reel that showcases your talent in a couple of minutes. Read these insiders' tips to ensure your showreel stands out from the crowd BY ANDREW OSMOND

Landing a job in 3D is a bit like auditioning for the lead in a Hollywood blockbuster. In an audition, an actor has only a few priceless seconds to impress, and, likewise, a 3D artist will usually only have about two or three minutes to showcase their work. If the recruiter's time is short, he or she might make a judgement call in the first 15 seconds, so there's no point saving your best stuff for the end. You've got to shine from the start, playing to your strengths.

As DreamWorks' European Representative, Shelley Page says: "There's no such thing as a student film that couldn't do with editing." Demo reels are entirely different from student films – unless you've made the next *Geri's Game*. Many student films take on too much, resulting in what one jaded recruiter describes as: "typically five minutes of poor animation on poorly rigged models in poor environments." Demo reels are about focusing on one's strengths and not trying to be, for example, a character animator if your genius lies in

modelling and texturing. "I don't want to wade through a showreel where someone's thrown in everything they've ever done," says Dave Throssell, Head of MillTV.

Do your homework: target the places that need your skills. Different studios have different structures for dealing with demo reels: your work might be viewed during a coffee break, or as the 42nd application in a mammoth session where the 41 before you all sucked.

But whatever the situation, you want the viewer to sit up as your stuff comes on. Below, industry professionals from all levels of the 3D industry show you how



#037

**HAZARD!**

The route to creating a successful showreel is full of potential roadblocks. Keep your eyes peeled for the hazards...





FEATURE

DEMO REEL, PORTFOLIO OR WEBSITE?

It's not just your reel that will make a good impression. Presentation is crucial

As well as thinking about the 3D content, it's worth giving ~~serious~~ consideration to the supporting material in your reel - it can be a vital part of selling yourself. CVs, portfolios and website links can all boost your chances. Be wary of sending hard copies packaged with your disc or video tape, as it's easy for material to get separated at the other end. It's far better, if possible, to include material on the disc or tape itself. Hard copies are more useful at the interview stage, where you might find yourself shunted into a back room without a PC to hand. "In your CV, be clear and be relevant. Avoid clutter and don't waffle," says Paul McLaughlin, Head of Art at games company Lionhead. "You should include a 'statement' or a more casual letter; it's always good to have a personal touch; it gives us an idea of the applicant's personality. And make sure that it's all up to date."

If you have relevant work online, then you can use a web-site link to point recruiters towards it, with the advantage that they won't expect it to be as thorough and focused as the demo reel. However, Godemasters' Principal Artist, Jolyon Webb, warns against using websites as a substitute. "Definitely include a site link, but I wouldn't rely on people taking the time to go there. I've been sent a lot of CVs

where people feel they don't have to include anything else, and when I follow the link I found it's on some kind of free

A PORTFOLIO SUPPLEMENTS YOUR 3D CONTENT, WITH CONCEPT SKETCHES THAT SHOW THE RECRUITER HOW YOUR IMAGES EVOLVED

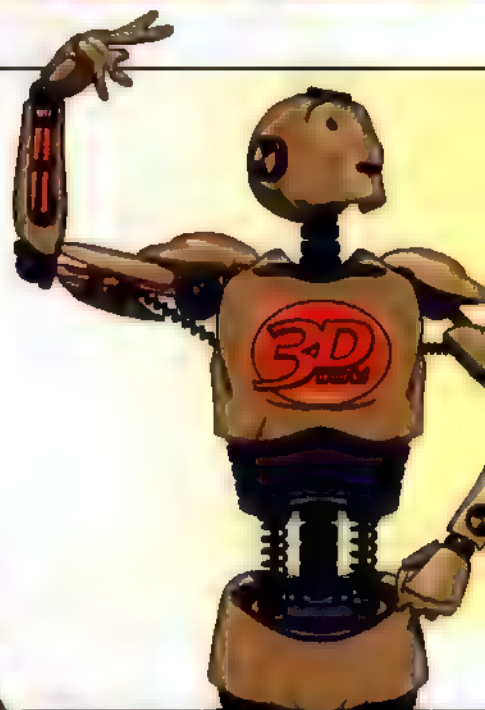
A portfolio highlights your core skills. If you're applying for a lighting position, you might send examples of your photography. If you're into character animation or design, then your life sketches could be useful. A portfolio directly supplements your 3D content, with concept sketches that show the recruiter how your images evolved (and that they weren't just copied off the Internet). Sketches that display your 'working' are especially germane to modelling oriented posts - it's good to include a page or two showing all your thought processes.

hosting, or it's expired, or it's just unbelievably slow to download. What you need are images that people can see extraordinarily easily, on any machine." Page agrees: "Most of our recruiters, unless there's a pressing reason, don't have time to log on to people's websites. We need the material in front of us."

However, it depends on the individual circumstances in which the reel is viewed, and some companies find websites congenial. "I think the idea of [physically] sending showreels is gradually disappearing," says Throssell. "If someone emails me with web links to examples of his or her work, I can just click and load, and if it's at all interesting I can send it to 20 more people in the company without moving. I've employed a lot of people after perusing their websites."

HAZARD!

Never save your best work for the end of your demo reel. It's practically a guarantee that the recruiters won't get to it



TECHNICAL CONSIDERATIONS

Be. As. Clear. As. Possible

When it comes to the technical details, the watchwords are clarity and transparency. You can't talk the recruiter through the demo, and they won't have time for long explanations, so you need to set everything out as plainly as possible. One of the reasons why recruiters don't like student films is that they're usually team efforts, and it's often unclear what the applicant contributed. "If there are three characters on screen, then tell us which one you lit or animated or modelled," says Helen Bruneden, Development Manager at Aardman Animations. A clear, concise breakdown is highly advisable, along with a list of the software you used.

An indispensable way to show your modelling process is with wireframes - recruiters can examine them at their leisure. "A demo should either show a figure in wireframe view, or with a grey plastic shading with the wires displayed on top. That's really important," says Webb. "As well as the wireframe, applicants should also show their models in a neutral pose with the textures on, ideally with neutral lighting. You shouldn't need to do renders, but take screenshots instead. Then you can put a neutral background in, hide everything else and maximise the view. Grab both the textured model and the wireframe in the same view. Ideally, you'll have one or two images, showing the initial concept sketches, the wireframe, the shaded view and the texture sheet."

Turntables showing a model rotating through 360 degrees are also welcomed

ARTISTIC CONSIDERATIONS

Don't stand out for the wrong reasons and avoid clichés like the plague

It's better to do something that's simple and done well, than going for more complex projects and looking like an amateur. Throssell remembers how he picked his new recruits out of 50 showreels. "One had done a really good character walk cycle, so I thought, well, she knows how to animate. And there was a guy who'd taken the time to make the simple stuff look consistent: good colour, good framing, and good aesthetics. Neither reel was funny or had stories. But if people can create a little test animation and make it look good compositionally, aesthetically, or just in their choice of colour – it shows they've an eye for a good picture, and they're more likely to get the job than someone who doesn't."

Demo reels need some flair, but never at the expense of basic skills. "If it's a choice between originality and technical quality, again I'd go for something that was

simple and done well," says Throssell. Matthew Sager, HR Manager for the Moving Picture Company, agrees: "Originality is good to see, but it's craft we do here, we're looking for people who are skilled technicians with a highly developed aesthetic. We're interested in what you think looks good."

That said, there are some CG clichés to be avoided if possible. "If there's one thing that makes my heart sink, it's a demo with spaceships," sighs Webb. "They're usually textured cylinders that don't display any modelling skills: you can't see weight, they don't interact with surfaces, they don't display composition, and they're a cliché that has been done for 20 years." Other clichés to avoid – unless you have a truly new take on them – include dragons, robots, cameras endlessly flying round sets and worlds populated by supermodels and manga heroes.

"Sometimes I'd love to see a grocer's shop or an elderly woman," says McLaughlin. Page urges DreamWorks hopefuls to forget the metal worlds of sci-fi and tackle organic environments.

Your reel must focus on your strengths, but remember who you're sending it to. "We see an awful lot of dark rainy things, because that's the standard in the visual effects industry," Page notes. "But that doesn't work for us, as anyone who's seen our films knows!" Throssell adds: "If you're keen on trash metal and have that as a soundtrack, the person who sees it might share your taste. But remember, there'll be 200 more people in that room, and you want to show them what kind of person you are. Avoid 'funny' showreels that show things like Darth Vader farting, which may make everyone on your course howl with laughter, but could embarrass you five years later."

QUALITY CONTROL AND LENGTH

Cut anything that's not up to scratch and leave them wanting more

Most recruiters agree that a demo reel should ideally be two or three minutes

– perhaps even less. The cardinal rule is that substandard work should be avoided at all costs. And what is 'substandard'?

The classic cases include character animations with feet that (unintentionally) slide, or go through the floor. "That's a classic; you see it again and again!" says Jolyon Webb.

"If you're a modeller, and if there's anything boxy on something that's meant to be built out of muscles, or if it looks unnaturally stiff, take it out. And if you're a mechanical modeller and there's any part of

your glossy car that looks like it's been in a crash and has been badly re-sprayed, take it out."

A wider definition of substandard work is anything you hesitate over including. "If you show something to your family and they think it's wonderful, it doesn't mean much," says Webb. "If you show it to someone who doesn't adore you and they pick up the fault, then it's not up to scratch. I often get demos from people who know something isn't good, but for some reason they've got an emotional attachment to it, because it's modelled on a girlfriend or it was the first robot they built. Those are really terrible

reasons for choosing work for your demo reel." There's no room for being sentimental, then!

Unfinished work-in-progress might be worth including if it's of high quality. The downside is that it begs the question of why it's unfinished. At worst, it might give the impression that you can't complete projects. Throssell suggests that unfinished or 'flawed' animations make for potentially useful talking points at the interview stage. "When you go in to see someone you could take a different reel with more material, and explain, 'This isn't perfect because...' and talk through the problems you encountered."

HAZARD!

Whatever you do, never send demo material as email attachments. This is the age of the virus, and companies will just delete them

– some value them more than wireframes or texture maps. "It's obvious to us that what you're meant to be looking at is the character itself, rather than the character's movement," says Webb. "It's a way of displaying the model."

Remember that many jobs require particular software skills, so tailor your demo to the job description. Being able to use the basics well is more desirable than a hazy knowledge of the latest software. "I'd rather see something good in *Flash Animation: Master*, than a poor effort in the spangly tool of the moment," notes McLaughlin.



HAZARD!

Never apologise for anything on your showreel. When advertising yourself to employers, you should show you're proud of your work

FEATURE

CHARACTER ANIMATION REELS: BACK TO BASICS

It never hurts to swot up on your skills, to give your work that extra something

Ben Turner is Creative Director at Cosgrove Hall Digital, one of the studios that has switched to 3D in recent years. He argues that the fundamentals of character animation are overlooked in demos. "I see many reels where the character animation lacks a real presence. It's a problem with recent graduates, who've often not rubbed shoulders with people who have experience in moving a character. What they miss are those old-fashioned techniques that make the difference between a character

just moving, and one I believe in." But in order to get that special something into your work, a bit of extra work is required. "Character animation is probably the hardest area to get into, and if it's your goal, you need to do some private study," says Page. She recommends classic 2D texts such as Richard Williams' *The Animator's Survival Kit*, along with Isaac Karlow's

The Art of 3D Computer Animation and Effects.

"DreamWorks' challenge is to get the squash-and-stretch look from traditional cartoons, and it's not possible to get into the upper echelons of character animation without those skills. What we want to see is a mastery of basic

things like weight and volume, and we'd prefer an unrendered character to see them better." If you're showing off your animation, models are a secondary concern. "It's enough to see a box-figure or just the skeleton of the animation, with the movement clearly presented," says Webb. "As a games company, what we want are small discrete pieces of excellent full-body movement animation that loop smoothly: walks, runs, climbs, impacts, movements with effort, movements with recoil, anticipation. You could start with a standard character 'idle' and show three or four animations that come out of that, like a collapse animation, a leer animation, a sigh animation, followed by returns to the base pose. Something like that would really impress us."

HAZARD!

Don't believe reports suggesting that 2D techniques aren't relevant: "That's absolute rubbish!" scoffs DreamWorks' Shelley Page

CHOOSING YOUR FORMAT

Video or DVD? DigiBeta or DivX? Oh, it's all so confusing!

The bulk of demo reels are sent on VHS and DVD. Both formats are still serviceable, and preferred by many companies because of the fewer compatibility problems they pose. A physical format like DigiBeta or a non-standard codec like DivX are less advisable, as many companies simply don't have them. A point to remember is that demo reels sent to America must be on NTSC tape or a Region 1 or (preferably) all-region DVD. The resolution should obviously be as high quality as you can get – third or fourth generation dubs won't pass muster – especially if you're applying for a lighting post.

If you're submitting files on a CD then, again, keep it simple. "I've had loads of problems interviewing people who had complex flash presentations. I'd load them, then find half the codecs are missing," says Webb. "If you put stuff on CD, it's better to put it in a variety of codecs. For example, if you send an animation CD, you could have a folder labelled, say, 'Walk loops', and then sub-folders inside that in QuickTime, Microsoft, MPEG and so on, so there's something to fall back on."

The setup at DreamWorks is a good example. European Representative, Shelley Page, works on a Mac and has problems with dunes that either she or her stateside counterparts can't play. "I can't open AVI, MOV or MPEGs, while DigiBeta won't work in the States. DVD is the preferable format for us, with VHS as a fallback. If it's an all-region DVD, so much the better."



MAKE SURE THAT YOUR TAPE, DVD OR CD HAS WHAT IT SHOULD HAVE ON IT – AND NOT LAST NIGHT'S EASTENDERS!

MODELLING AND LIGHTING REELS

To show off your skills to the best of their ability, think 'originality' and 'quality'

We're looking for people who understand form," says Chris Longmore, Managing Director of UK-based Drive Ltd, a computer-aided design company in the field of automotive modelling. Longmore says that models should always be grounded in sketches. "It's not just the result that counts, it's very much how you got there. We need to know that an applicant can interpret a sketch, understand what's going on around the back, and turn it into a 3D model."

As for the models themselves, Longmore says he looks for clean construction and good quality surfaces. "We want digital data that can be used downstream not just for visualising and animating, but also for creating physical models, CNC-milled models, SLA models and, at an extreme, going through to production tooling surfaces [SLA involves a 3D model being physically drawn onto the surface of liquid plastic by a computer-controlled laser. CNC milling refers to the physical cutting and shaping of metal by computer-controlled machine tools]."

"We'd also like to see visuals that cover three different areas. The first type would be visuals that communicate to a design review, such as a raycast visual that shows form

very well so you can see highlights and reflections.

The next level is more marketing-orientated visuals, more about accurate colours, textures, graphics and photorealism. The third type would be a stylised advertising shot, where we're getting across the feel of the product but you might not be able to tell what all the surfaces are doing." Posts in modelling, lighting and technical direction should demonstrate a well-rounded experience, though sometimes it needs to be weighted towards a particular skill. Where DreamWorks wants realistic textures and models that fit Shrek-type environments, other studios welcome applicants who demonstrate they can work around the spectrum.

HAZARD!

Don't reproduce existing cartoon characters or film actors. However good they are, you need to show you can invent your own work



REMEMBERING THE OBVIOUS

Yes, we know you know. But you can forget the basics in all the excitement...

There are some things that go without saying, but it's easy to forget about them and still slip up. For starters, make sure that the demo reel is clearly labelled with your contact details, and that these are accurate and up-to-date. Make sure they're somewhere onscreen as well, in case the reel gets separated from the packaging. Check that your tape, DVD or CD has what it should have on it. "You wouldn't believe the amount of things we receive from applicants with nothing on them," says Brunsdon. "I remember receiving a VHS tape that was meant to have a demo reel on, but when I checked it, I found myself watching the previous night's *Eastenders*!" If you've already done work for a commercial 3D company, think about what you send out in malleshots for the world to see and don't be too 'free' with material that should be properly confidential (after all, the

CGI community is quite small, and things have a habit of getting around). While this is a matter of judgement - for example, one can arguably show material in one-to-one contexts that shouldn't be included in a broadly aimed demo - it's still an area where there's no substitute for common sense.

HAZARD!

Don't put contact details only on your cover letter. Put them on screen in your demo, with any other important details, in case the letter gets lost





FEATURE



PACKAGING - PLAIN OR GIFT-WRAPPED?

Put that pretty pink bow down, and read on to see how to pack to impress

There's a slight difference of opinion among companies as to what kind of packaging is required. Some recruiters argue that it's practically irrelevant, beyond an image on the box that gives an idea of the content and a clear interface guiding the viewer through. "Big flashy things are not required for me," says Ben Turner. "As long as I can identify it, and there's a name and a picture, that's fine."

But a dissenting note comes from Brunson: "A demo reel could be in a different package - it's all about marketing yourself. Perhaps something specially designed with Aardman in mind, something eye-catching." Also, Webb notes that good packaging can have a

practical use: "If you're sending a CD, put it in a hard case and put in a glossy print showing your most interesting piece of work," says Johnny Webb. "Put your name and email on the case, and felt-tip them on the disc itself - I'd put them on every CD image too. As for the interface, I'd personally present it all as JPEGs and files to download, because you're going for certain kinds of design job. I like to put in a CD which opens up without trying to auto-run or do anything fancy." It'll (literally) pay to make their job easier...

HAZARD!

Never send out a form letter, or one that's from a template. Always get the name of the right person to contact, and personalise every communication

SENDING THE REEL OFF

How not to act like a stalker and still seem keen

Some companies, such as Aardman, notify people that they've received their demo. Otherwise, you might follow up with a brief email saying that you hoped the demo arrived safely and reiterating your enthusiasm, but don't expect a reply. "The general rule of thumb, especially with a big studio, is don't call us, we'll call you," says Page, who usually can't cross her floor for demo reel submissions. "We have our databases, and, although the material may not be suitable for our current project, we do a review when we're looking for people who might be suitable for the next project, and we call them back."

"We've sometimes hired people years after they first applied." But what if you've completed a new project since you sent your reel in, and the studio haven't seen it? You don't want to bug them, as they're probably really busy,

right? Not necessarily: "It's always worth sending an update of your work," says Page. "If someone has done a new project since the last time we saw them, then by all means send it in on a reminder reel."

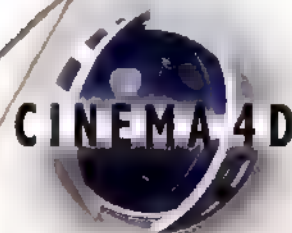
This is something that's emphasised by Seger: "It's always worth re-submitting your reel, if you've done another job, or another piece of work in the meantime," he says. "We've got a library and a large database, and we keep everyone's demo reel that we're interested in."

HAZARD!

Brits: don't put together a reel for a US company until you've checked you qualify for a stateside visa. Even at entry level, the requirements are tight

FOLLOW UP WITH AN EMAIL BUT DON'T EXPECT A REPLY. THE GENERAL RULE OF THUMB IS - 'DON'T CALL US, WE'LL CALL YOU'





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LIGHTWAVE ADVERTORIAL

Jose Perez (USA)



We speak to the Floridian responsible for turning the Mini into a robot for BMW – not to mention modelling for TV, music videos and now an upcoming film

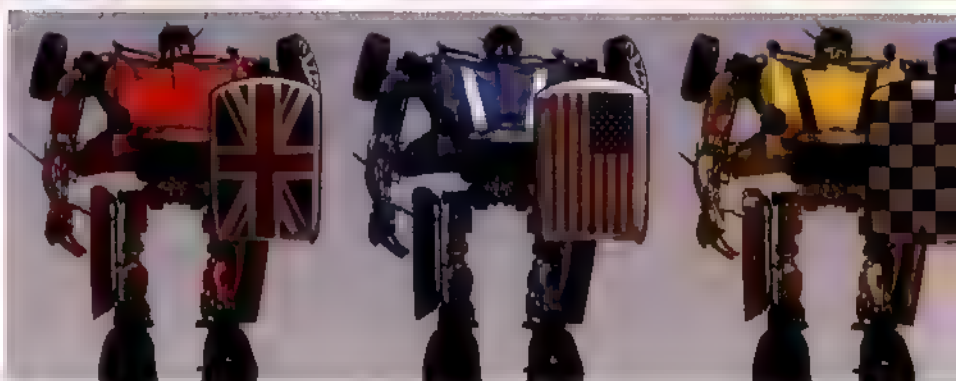
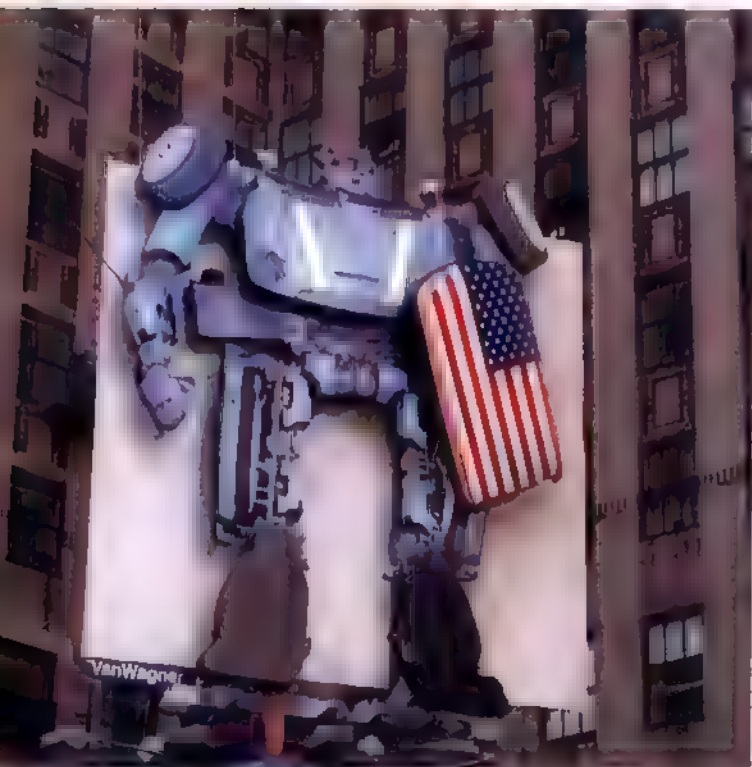
Earlier on this year, a shabby, low-tech website (at www.r50rd.co.uk – have a look!) became the talk of robotics geeks and 3D artists alike. It purported to show a Mini Cooper that had been transformed into a robot rescue machine by a kindly old English inventor. Everything looked good, really good, but there was the suspicion that it couldn't possibly be real. We speak to Jose Perez, the man behind the 3D modelling of the Mini robot.

TELL US A BIT ABOUT YOURSELF.

I'm a freelance Visual FX artist. My work includes contributions to TV, film, music videos, commercials and the print industry. I currently work out of my home office in Miami, Florida. I've always lived here, except for a brief period of five months in California, where I got my foot in the door of the TV/CG industry. Personally, my interests are in all things sci-fi, anime, comics and computer technology. Oh, and I'm a big movie buff – I love all genres. When not in front of a computer, I spend my time with my beautiful wife and two daughters.

WHEN DID YOU SEE LIGHTWAVE FOR THE FIRST TIME?

Towards the end of the '80s, after being an avid Commodore user towards the end of high school, I saved up to get my first Amiga. It was an Amiga 500 and I started dabbling with *Turbo Silver* and then *Imagines*. CG tools were becoming more powerful by the day, and like most budding 3D artists, I dreamed of some day working in a field that was using them. It was at this time on one of my frequent trips to the local Amiga store, that I





spotted an Amiga 2000 with a NewTek Video Toaster and LightWave. I was floored.

WHAT DO YOU LIKE ABOUT THE PACKAGE?

I've always been a fan of the Modeller portion which coincidentally happens to be what I specialise in: modelling and texturing.

WHAT SPEC MACHINE(S) ARE YOU USING IT ON AT THE MOMENT?

I use it on a home-made PC: Intel 3GHz with 4GB of RAM, 500 GB HD space, and an Nvidia 6800 video card. I also have an OS X Mac running LightWave, and several other PCs that I use as render nodes.

ARE THERE ANY PLUG-INS YOU WOULDN'T BE WITHOUT?

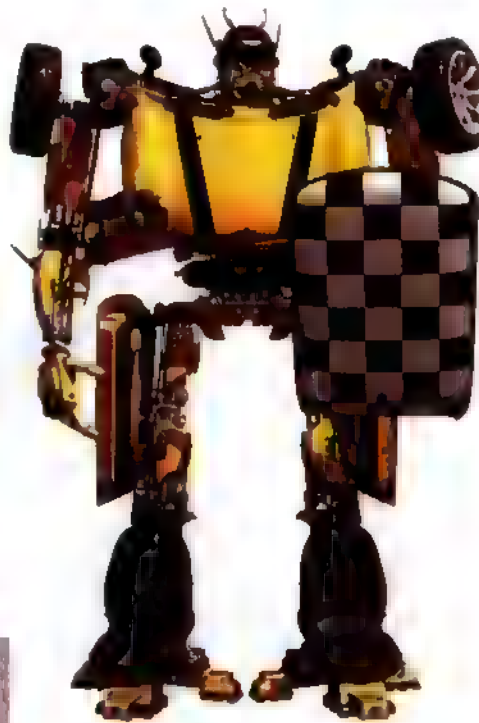
Until LightWave 7.5, I used VertiBevel quite a bit, but with the release of LightWave 8, a similar feature [Rounder] is now built in. I can do almost anything in LightWave's Modeler, but if a plug-in becomes available to make my job quicker I'll use it – for example, a tree generator or cloning tool. I like shaving corners so I can move faster.

HOW DID YOU GET THE JOB WORKING ON THE MINI-ROBOT PROJECT?

During the past couple of years I've worked mostly for Zoic Studios (www.zoicstudios.com). At some point last year after finishing work on the *Battlestar Galactica* miniseries, I was asked to model and texture the Mini Robot for a Mini Cooper ad campaign – I gladly accepted. The project was a collaboration between Zoic and the Crispin, Porter, and Bogusky Agency.

COULD YOU MAKE AN ACTUAL MINI FROM THE ROBOT PARTS?

Yes and no. Most of the parts are built from actual Mini Cooper components, but I had to bend and modify several of them to make it look like the robot was machined together in a bodyshop style. Some of the arm and leg padding has an armour feel to it, for example.



DID YOU GET NICE BLUEPRINTS FROM BMW, OR DID YOU HAVE TO GO SEARCHING ON THE WEB LIKE OTHER CAR MODELLERS?

Yes, I received a catalogue CD of official BMW/Mini Cooper parts that it used in its service departments, which contained detailed and accurate drawings of all of the pieces, from the largest to the smallest details. I also visited a local dealer to photograph some Minis from certain angles I needed, as well as collect an official car catalogue to sample paint and surfaces from. In addition, Andrew Orloff and Carla Attanasio from Zoic Studios provided me with tons of digital images from a photo shoot they did in a California dealership. I also had a few concept drawings of what the robot should more or less look like. With that in hand, I started the process, getting feedback along the way to make sure the client liked the direction we were going in.

HOW LONG DID MODELLING TAKE?

The original deadline was about 6-7 weeks from beginning to end, for one finished robot, which was to be used in magazine ads and on a billboard. Bear in mind that this needed to be a high polygon count model, and have a full working engine and dashboard section under the chest [the car bonnet].

The model was completed on time, then modified a little bit and re-textured for the animation of the web clips, and other web and print uses. I stayed on and off the project after that for several weeks, doing all of the lighting and high-resolution renders, and colour changes for different billboards and ads that the client needed. Originally, I was to build one robot, with a total of three colour variations. Along the way, the client asked for versions of the regular Mini and a Mini S version, as well as different rims on certain models. So I ended up making well over ten versions of the robot, plus different lighting rigs for different settings. Some were photoreal, some with stylised studio lighting. In the end, I can't even remember the total time it took, but at a rough guess, I'd say around three months in total.

It was fun to work on something different like this. It's one thing to see your work on screen or TV, but to see your work on billboards in Times Square, magazines, websites and newspapers was quite an amazing feeling.

HOW DID YOU ACHIEVE THE CAR PAINT LOOK?

The car paint took some tweaking – every render for all the different types of media required different lighting and that's why we used different surface settings.

Most of the renders were done with a combination of HDRI environment lighting and area lights, some using regular three-point or four-point lighting and reflection maps stitched together from actual location pictures. That's nothing new; just gradients on incident angles for reflection and spec channels, combined with colours I had sampled from the catalogues. In some of the stylised renders, I used radiosity with white boxes to light the scenes on dark backgrounds. On most of the photoreal renders, I used some HDR images taken by [Zoic's Creative Director] Lori Penstene on location where the live plates were being shot. I ended up enhancing the lighting and reflections quite a bit.

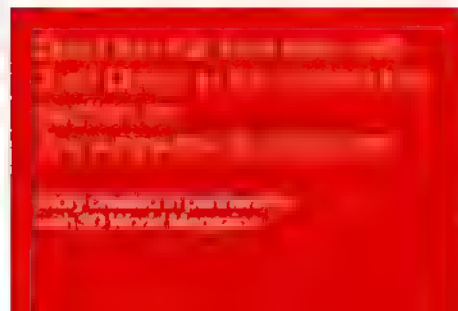
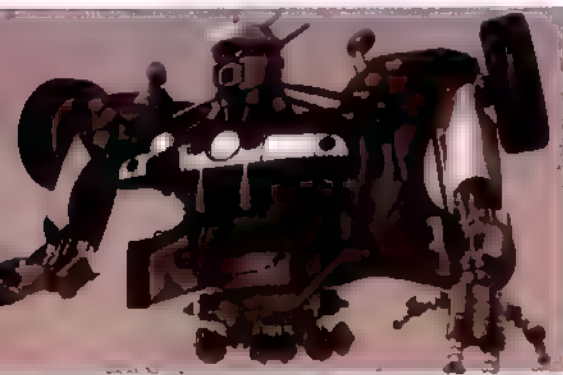
For the dirty engine parts, standard grime images and dirt techniques were used to simulate oil streaks and general wear and tear.

WHAT ARE YOU WORKING ON NOW?

Right now, I'm working *Serenity*, the *Firefly* feature film again with Zoic Studios.

Build your own Mini robot at: www.miniusa.com/cm/dive_back_in.jsp?target=robotconfiguratorcoopers&link=home. Anyone interested in seeing more of Jose's work should visit his website at: www.fxstation.com.

■ Ben Vost



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CHARACTER CREATION IN 3DS MAX 7

There's more to 3ds max 7 than the inclusion of character studio 4. Here, 3D Artist Chris Ollis demonstrates some of the key benefits of the software for character animators – so fire up the fully functional demo of 3ds max 7 on the CD, and get moving... **BY CHRIS OLLIS**

A new version of 3ds max has arrived and, once again, Discreet has continued to develop its toolset for character creation and animation. With this release you get more bang for your buck, in the form of *character studio 4*. Now included in the asking price, this renowned piece of kit – formerly a third-party animation module – will be a welcome freebie to those who've tried it, and an exciting new world to first timers. Automated skeletons, instant walk cycles, layered animation creation and, of course, crowds are now all to hand and raring to go.

But this release isn't all about *character studio 4*, not by a long shot. To demonstrate some of the new features, we'll take the monstrous Biped-powered creation shown in the illustration on the right, and put it through *max 7*'s paces. To begin with, we'll play with the new TurboSmooth modifier and look at its uses when combined with the creation of Normal maps. The new Projection modifier will continue the theme of Normal maps, as we paint a low-poly model with all the complexity and detail of its high-poly cousin.

The second half of this tutorial will look at developing the character in terms of animation. We'll use the new Skin Morph modifier to bring some extra life to the model's fleshy areas, and the Skin Wrap modifier to demonstrate some super-fast amendments to the model's appearance.

These new tools are incredibly adaptable and the procedures we'll cover here will only be scratching the surface of what they can do. But with a little thought and practice you'll soon find yourself applying them to all sorts of problems, and wondering how you ever coped without them. So fire up the demo version of 3ds max 7 on this issue's cover CD and enjoy.

CHRIS OLLIS

www.interTwined.co.uk



Chris Ollis works as a character artist at Codemasters. In his spare time, he contributes to *3D World* and tries to tell people that *Private Dancer* was actually a pretty revolutionary bit of 3D gaming – not an excuse for smut at all!

FACT FILE

Characters in 3ds max 7

FOR

>> 3ds max 7

DIFFICULTY



ON THE CD

>> Step-by-step scene files
>> Full-size screen shots

ALSO REQUIRED

>> Photoshop Paint Shop Pro or similar
>> Previous experience with 3ds max

#049



TUTORIAL

>> PART ONE

Normal maps and TurboSmooth

Modify your mesh the max 7 way with these useful new features



1 Load the file MAX7_01.max from the cover CD. This file contains two versions of our monster. One is called 'Simple', the other 'Complex'. The models vary in mesh detail and 'Complex' also has a Bump map applied to add some finer lumps and general noise (render it if you are really desperate to see the effect).



you'll see that they share the same UVW coordinates. This is important for the next step.

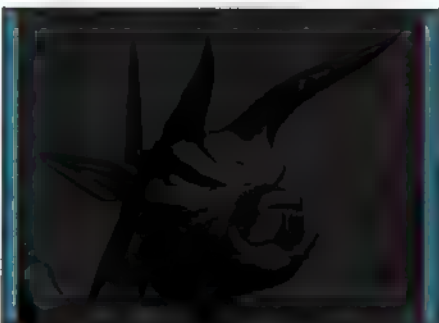
2 Apply an Unwrap UVW modifier to both models. When you do this, you should notice the new Edge Seam feature (one of many new features). This is a handy addition to the old Unwrap modifier that shows you where your unfolded mapping stops. Hit the Edit button on both models and



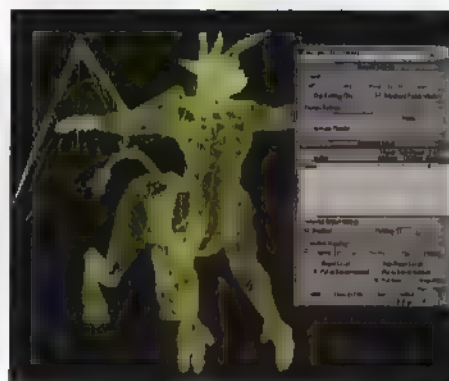
3 While the level of detail in 'Complex' is better than that of 'Simple', it's still a little harsh around the edges - so we'll fix that with the introduction of the new TurboSmooth modifier. Select 'Complex' and press [7] to bring up the Polycounter in the viewport. Now select TurboSmooth from the Modifier list and watch the face count leap up.



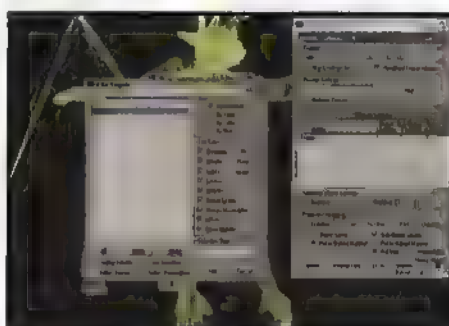
4 Set iterations to 2 and make sure Isoline display is off so you get the full effect. You should now have a model with 106,000 faces - which is just a few more than we started with! You should also notice that the viewport hasn't seized up like it used to with the old MeshSmooth. The new TurboSmooth really does what it says on the tin.



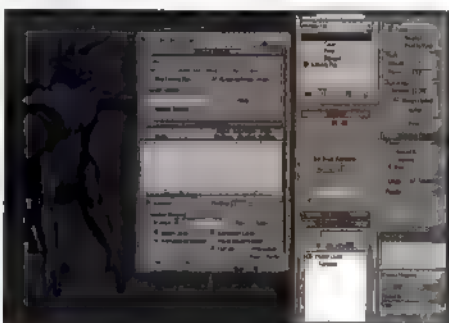
5 With 'Complex' all smoothed out, we're almost ready to attack the wonderful world of Normal mapping. If you don't know what Normal mapping is, have a quick read about it in the Tips Box on the left. max 7 has spotted the developing need for this process in games creation and has supplied a tool that's just the job.



6 To transfer all the detail and smoothness from the 'Complex' model to the 'Simple' model, we must first overlay the models. So move 'Complex' to 0.0 on the X axis. Some bits will obviously protrude. Don't worry: just get it as close as you can for now. Then select the 'Simple' model and bring up the Render to Texture panel (Shortcut key [0]).



7 In a similar way to creating a baked lighting texture, we'll use Render to Texture to create a Normal map of the 'Complex' mesh. Set the Output Path (the location where the new Normal map will be saved) to somewhere you'll remember. From the Projection Mapping section, tick the Enabled box, click the Pick box, and select Complex from the list.



8 Have a look at the 'Simple' model's Modifier Stack. The new projection modifier has been added. This is a powerful bit of kit that can project UVW coordinates, Vertex colours and all sorts of data between models. Here, it's being used to project the Normal Data from one model to the other.

EXPERT TIPS

NORMAL MAPPING EXPLAINED

>> Normal mapping is a technique used to transfer detail from a high-poly model to a low-poly model using a texture. It's a similar way to Bump mapping, but with a Bump map providing only height information along the Z axis, a Normal map provides information for all three (vertical) axes. This results in an efficient, compact way to transfer detail from a high-poly model to a low-poly model, while maintaining the visual appearance of a high-poly model.

>> PART TWO

Projection Cage and modifier

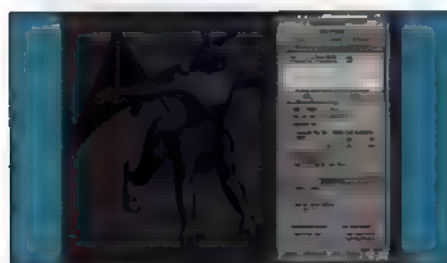
Render out your Normal map with the Projection modifier



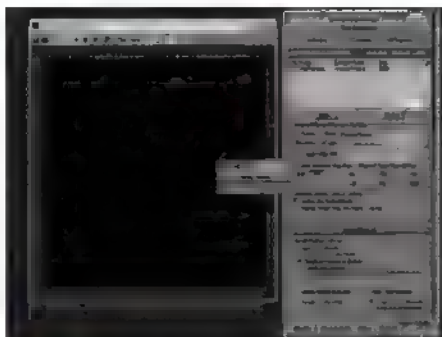
9 The blue mesh visible around the model is the Projection Cage. This is like a frame of lights that will beam the information down onto the model within. It's important that the cage covers the model on which it's projecting, so if some areas are sticking through, hit the Reset button on the Modifier panel and adjust it by scrolling the Push value until it's how you want it.



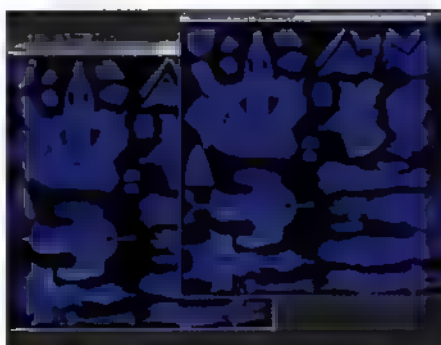
10 You can move individual vertices or faces, if you want, by working on a sub-object level. If the cage around your monster's fingers is at its limit (you don't want it becoming too blobby or overlapped - this will spoil projection results) then this is the best way to fix such areas. Once you're happy with the Cage, go back to the Render panel.



11 In the Output section give the file a name like 'MonsterNormal' and make it a TGA file. The 'Target Map slot' refers to the Material Editor slot that it will automatically put the new texture into. Don't select anything there for now: we'll deal with this later. Check that the Size is 1024 (at least) and then hit the Render button at the bottom.



12 max will now render the Normal map out in relation to the model's UVW mapping. Areas of bright red refer to sections that the Projection modifier has missed. To fix these quickly (and avoid too much fiddling around with the cage) we'll touch up the final render in Photoshop - make sure you check the Alpha channel for mistakes too.

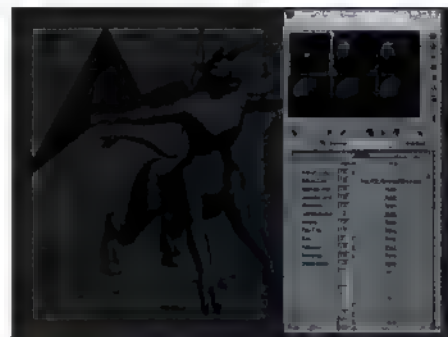


13 I've included both the rendered version and the retouched version of the Normal map on the cover disk for you to look at. All I've done is take a similar colour to the edge of each hole and Airbrushed or Cloned over the offending area. Once the Normal map is tidy, return to 3ds max where we'll apply it to the original model.

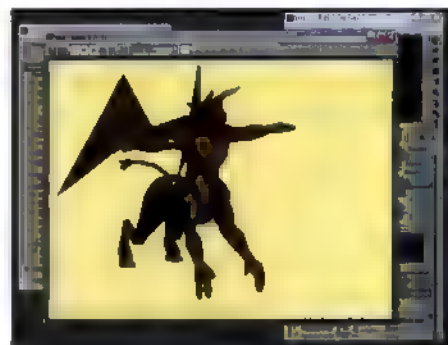
EXPERT TIPS

NORMAL MAPPING - COLOURS

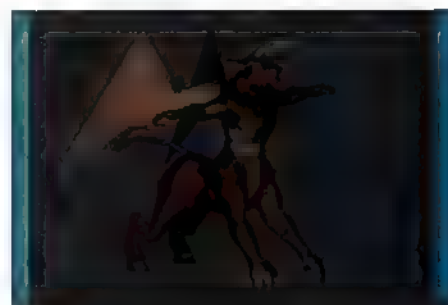
>> Whereas a Bump Map is usually a grayscale image (with white pixels being maximum offset along the Bump direction), Normal maps are a bit more colourful. This is to cope with the added directional information required to simulate the orientation of a Face Normal. Shades of red in the map describe the left/right direction of the Normal, green representing up/down, and blue provides the in/out vertical depth. In this end, the map will mostly be blue (as there will always be a Bump value) with hints of red and green to provide the twist of each elevated plane.



14 We'll apply the material in a new scene. Open the file 'MAX7_02.max'. It contains the low-poly model of the multi-limbed, winged beast which has been rigged with a mixture of a character studio Bipod, standard 3ds max Bones and IK Chains. It's skinned using the standard max 'Skin' modifier. Select the model and open the Material Editor (press [M]).



15 Select the first Material (labelled 'Monster'), move down to the Map slots and click on the Bump map slot. From the list, select 'Normal Bump'. Click in the 'Normal' box and select the TGA file you just tidied up (or MonsterNormal.AFTER.tga from the cover CD), then apply the texture to the model. You can see the effect if you render the model now.



16 With max 7 you can also see the effect in the viewports. Move down to the bottom of the Material Editor and, under DirectX Manager, tick the box to display the material with DirectX. The Show Map in Viewport cube will change to a pink and white one. Select this, and you should see the model in full effect in your viewport. Note: this does depend on the age of your graphics card.

TUTORIAL

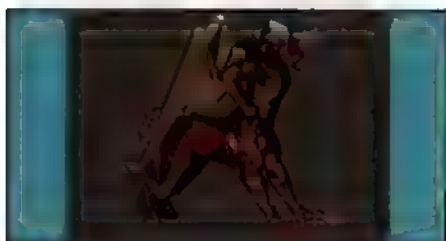
>> PART THREE

Skin Morphing

Use Skin Morph to attach realistic skin to your models



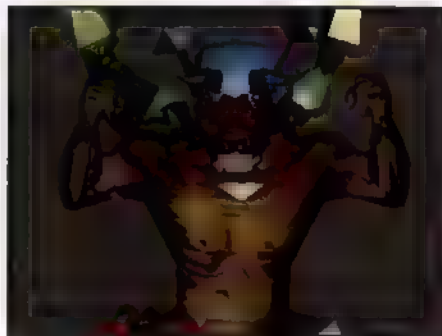
17 Load the file MAX7_03.max. It's the same model, but with a few keyframes added to supply some action. Hit Play to see what it does. We'll now introduce some more interesting movement. Unhide all the bones, then select the mesh and apply a Skin Morph Modifier to the stack. Click the Add Bone button and select everything from the list.



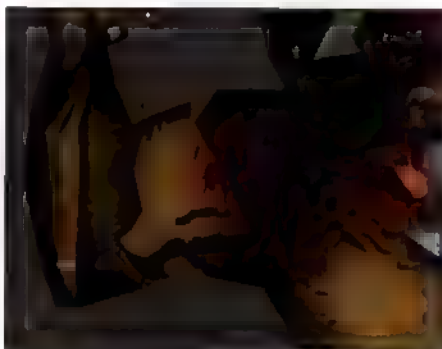
18 The Skin Morph works in a similar way to the Joint Angle Deformer found in the depths of the original Skin Modifier. It applies a preset morph to the mesh when a Bone moves up to a specific angle. The difference between the old Modifier and this new one is that the new Morph is a joy to use.

EXPERT TIPS

SKIN MORPH



19 Scrub the Timeline to frame 86 where the monster bends his arms like he's flexing his biceps. Select the right forearm (from the list in the panel) and hit the Create Morph Button. This records that at the current angle of the selected bone, a skin morph should occur - we've just got to create that morph now.



20 Select the Skin Morph Sub-object level Points (the morphing vertices) and press the Edit button. Start moving the Vertices/Points of the bicep to make it appear flexed. You'll notice that they change to a yellow colour to show it's a morphed movement. While you're bulging the Bicep you could tidy up the intersection at the elbow to make it a fleshier fold.



21 Deselect and scrub the Timeline slowly. Comparing it to the other bicep, you should see that not only does it flex at that point in time, but it also flexes throughout the whole animation. This is because the Morph works on the rotational value of the Bone it's attached to. So you could set up all the morphs at the start of an animation and sit back to watch the show...



22 To speed up the Skin Morph process, there's also a really useful Mirror tool. Select the right forearm again, and move down the modifier panel to the Copy and Paste section. Tick the Show Mirror Plane box and look in the top viewport to see the orientation of the plane. It's a little out, so move the Offset to about 11.7.



23 Check you're on the right track by ticking the Preview Bone box to see the left forearm turn red, and make sure you're back on Frame 88. Then simply press Paste Mirror and the vertices (points) will pop in to place. Simple! Scrub the Timeline again to see the skin flex.

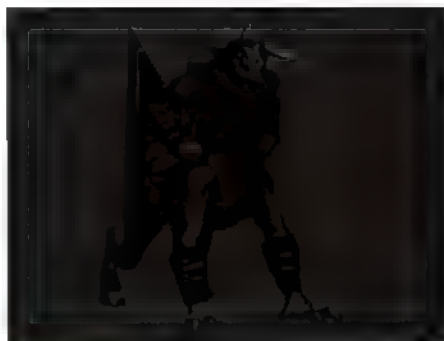


24 The Skin Morph is a fantastic automated feature that can be used to power many forms of animation. It's the ideal solution for fixing flaws in skinning and applying a more believable sense of sliding skin over shoulders and around the hips. With a little practice pinched joints and intersecting skin is a thing of the past.

The Skin Wrap Modifier

EXPERT TIPS

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32 This is a perfect example of how Skin Wrap can be used on a low-poly model which has been keyframed in one studio, before being passed to another to power a hi-res mesh for use in an FMV sequence. None of the tedious skinning, no delays: just straight in with the animation – brilliant. ■

Q&A

RIGHT Ouch – my eye!
Learn all you need to
know about how to
animate those springy
arm things in *LightWave*
and discover just how
complicated they
actually are!

Supporting files for this Q&A are
on the CD. Screenshots can be
downloaded from the 'Stop Press'
section of our website:
www.3dworldmag.com

LightWave

by BENJAMIN SMITH



“How can I animate one of those c-c-c-crazy
cartoony spring-loaded arms that shoot out with
a boxing glove on the end?”

TOM GARRETT | Indiana, USA



This is one of those projects that
seems like it's going to be a total
doddle to animate until you actually
sit down to set it up. It then suddenly
multiplies to a level of complexity
you'd never imagined. Although it's
a cartoony effect (and a favourite of
the cel animated exploits of Warner

Bros.), the transition to 3D means that you can't cheat
its fundamental physics. Because of this, animating
it to do the kind of action you're imagining becomes
pretty complicated.

That spring-loaded arm thing is, in fact, made up of a
series of wooden arms, each connected in pairs into a little
'X' shape, then linked end to end. The resultant device has
the unique property that, by opening and closing the end
pair of arms (like a pair of scissors), the whole thing shoots
forward and the arms at the other end open and close in
the same manner. The same principle is used to make
scissor lifts and cherry pickers, as well as amusing
instruments designed to pinch a girl's bottom from 20ft

away (by the way, those rumours are wholly unfounded
and I deny them vigorously, being in Bradlington on the day
in question, mind).

CUT SOME SLACK

What makes this a nightmare to set up in 3D is that you
can't cheat the functioning of the device. The arms can't
stretch or bend to allow you any slack, so you must make
it work right the first time. In the walkthrough on the right
you'll learn how to make a basic spring-loaded puncher,
but you may find it sorely lacking in some of the extra
animation effects that give it a bit more plausibility.

Once you've done the walkthrough, you'll realise how
complicated this effect is. The arm only works if it shoots
out directly in the Z axis, and there's no way it can droop or
wobble around like you'd want it to. You'll have to work
hard to make the spring look a bit more realistic – the struts
are going to have to bend and stretch if they're to stay
linked together when the arm isn't moving in a straight line.

One way of adding a droop is to use an expression to
copy the fist's pitch channel to each of the link nulls.

dividing by six to spread the droop through the arm.
Rearrange the targeting on the struts so, instead of using
the link nulls as a target, they use the corresponding top or
bottom joint nulls. This almost works, except the drooping
means the struts are slightly too long or too short. To get
around this, use a Range Finder expression (available via
the Expression Builder in the Graph Editor) to determine
the exact distance between the pairs of top and bottom
joint nulls. Apply this to the Scale.Z channels of the struts,
so they stretch slightly to compensate. An almost identical
technique was used in the *LightWave* Q&A in issue 34 to
stretch strings of saliva between the teeth of a monster – if
you don't understand what I'm talking about, it's time to dig
out those back issues. (Turn to page 74 to find out how to
get your hands on past copies on *3D World*.)

With all this in place, you can get on with the job in hand
(sorry) – animating the fist null so the arm shoots out
suddenly and then bounces back, recoiling in a really
languid droopy fashion. At least you don't have to worry
about how all those little arms and struts are working – you
can just concentrate on animating your spring-loaded fist
and leave the rest to *LightWave*.

BENJAMIN SMITH
www.redstarstudio.co.uk



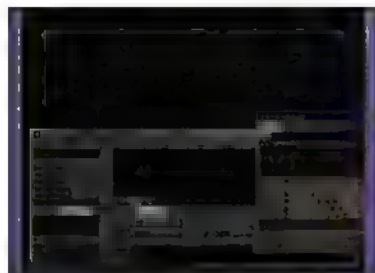
Benjamin Smith is the Director of Red Star Studio, a new creative digital
film production service. His favourite hobby is submitting half-finished
Q&As then sneaking off on holiday. And he thought we wouldn't notice.

STEP BY STEP: HAND OVER FIST

If the prospect of animating a spring loaded fist leaves you with stars spinning around your head, these steps will help



1 Load start.lwo from the cover CD, and add two nulls called Link and Fist. Parent the Fist to Link, and then clone Link six times to get seven Link nulls. Arrange these in a hierarchy (shown above), then select all the Links except Link 1. In Graph Editor, go Selection > Get Layout Selected to load up all their channels.



2 On the Expressions tab, click New to create a new expression. Name it 'stretch' and make the value $[Fist.Position.Z] / 6$. [Ctrl] + click to select all the Position.Z channels of the links and hit Apply to apply the expression. Move Fist in the Z axis and you'll see all those links neatly fill the space at regular intervals.



3 Now add a null and call it 'top joint'. Clone it six times and parent them to the Links, so you have one top joint parented to each appropriate Link. Select all of these and, back in the Graph Editor, go Selection > Get Layout Selected. While holding down [Ctrl], click each one to select all their Position.Y channels.



4 The next expression is really tricky to create, as it's based on Pythagoras' Theorem (the square of a right-angled triangle's hypotenuse is equal to the sum of the squares of its other two sides). But don't panic! I've saved you the effort by writing it for you. It's called Joints+Y, so just select it and Apply it to all those Position.Y channels.



5 Repeat steps three and four, this time with a bottom joint null, applying the Joints+Y expression. You should now have three rows of nulls. Load strut.lwo and parent it to top joint (1). Press [M] to open the Motion panel and set its Target Item to be Link (2). It should magically turn to span top joint (1), Link (2) and bottom joint (3).



6 Continue loading struts and parenting them to the appropriate top and bottom joints, then targeting them to the Links until you've got six struts making three X shapes. Rotate the struts that point up 180 degrees in bank so they don't intersect. Move Fist in the Z axis and the springy thing should spring itself open and closed.

LIGHTWAVE TIPS

If the whole Pythagoras Theorem thing got you all in a muddle, here are some more tips to clarify the whole process.

01 When you need to select (for example) all the Position.Z channels of a large number of items in the Graph Editor, an easier method than picking through with the [Ctrl] key is to go Selection > Filter Position Channels, then quickly select all the channels and go Selection > Filter Curves. In the box, type 'Z' and you'll see the X and Y channels discarded in favour of those wonderful blue Z ones.

02 Lazy readers can load the scene file *Indoorscene.lwo* from the cover CD to see the finished result with an oh-so-clever Range Finder expression laboriously applied individually to each strut. They mean that by moving and rotating the fist null in pitch you can make the string-thing droop once it's extended. Note that the fist null isn't where the hand object is actually parented – it's merely a central for you to use in the animation.

03 Of course, the same techniques used to make this spring-loaded arm could also be applied to making any manner of mechanical gubbins, including a cherry picker or scissor lift (one of those things you might see used to reach very high ceilings or, erm, pick cherries). In this event, it probably won't need to bend, which will save you a load of work, but you may need more than one of the arms to make the lift. In this case, sadly, you can't just save the scene and reload it to clone the arms (this adds a clone suffix to all the objects, screwing up the expressions). You'll have to build each one by hand.

For quick fixes for LightWave problems, post your questions in our online forum: www.3dworldmag.com/lightwave



"The SpaceBall creates an immersive experience. It feels like you are shaping your world rather than drawing it."

-Stefan Bayer, Director of Production, Streamline Studios

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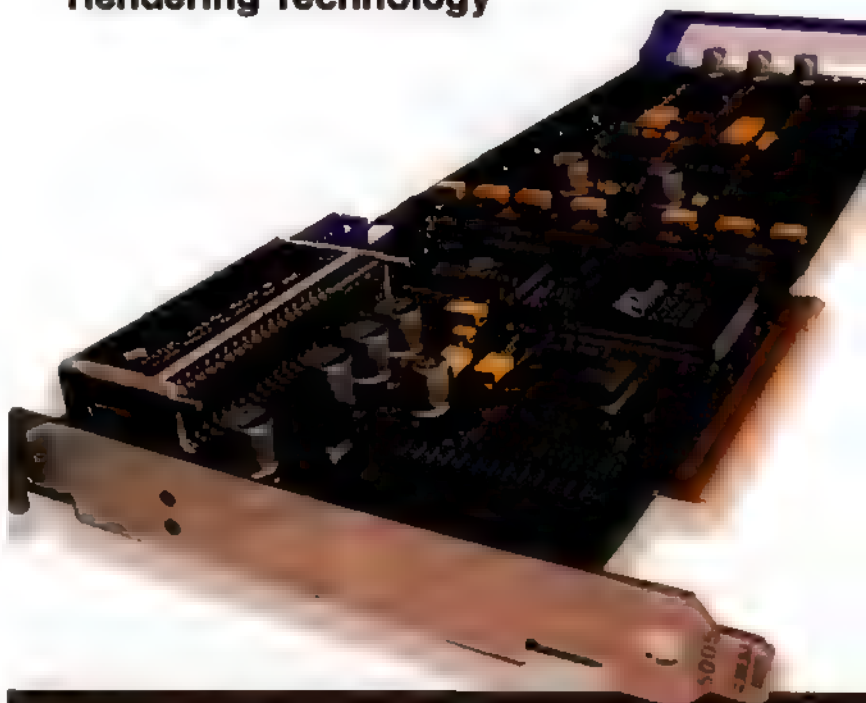


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THIS ISSUE!

Send us a screenshot of your 3D character, and you could win an entire day with leading European service provider Centroid Motion Capture, recording professional-quality mo-cap data to bring your creation instantly to life!

Have you ever wished that you could use motion capture in a personal animation project but been put off by the cost? Then we have the perfect solution. We're offering the chance for one lucky reader to win a full day at leading service provider Centroid Motion Capture: studio time normally priced at £5,000.

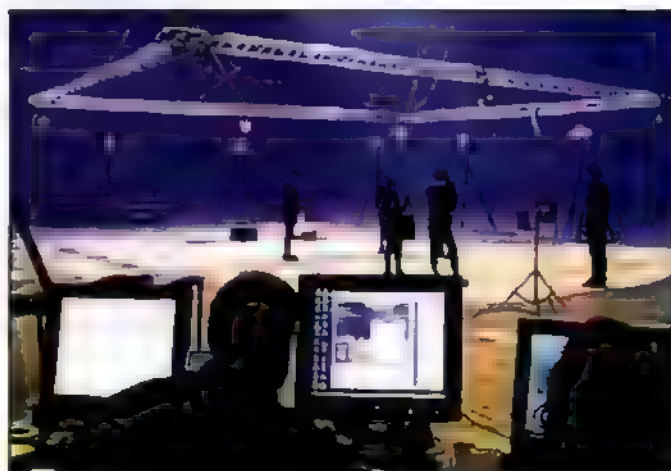
Founded in 1998, Centroid's vision is to bring affordable 3D character animation to the film special effects, commercials, long-form broadcast production and videogaming markets. The company currently has four studios worldwide, based in New York, London, Berlin and Belgrade. Each one uses Motion Analysis optical systems and can handle shoots of up to even 84 cameras at a time.

Centroid's staff offer an enormous breadth of experience in all the technical and creative aspects of 3D production. This includes a working familiarity with industry standard 3D packages such as *Maya*, *3ds max*, *Cinema 4D*, *LightWave* and *Softimage XSI*. In addition, all Centroid personnel are expert with *Alias MotionBuilder*.

In 2005, the company will also be introducing a revolutionary new way to shoot and process 3D character animation using 'real time' render engines and other products it has developed over the last three years. In addition to making motion capture more affordable, this innovative system will provide instant 3D rushes for video and animation

production, allowing a director to see multiple 3D characters working properly as they shoot. For more information, visit the company online at the following website: www.centroid3d.com.

To enter the competition, email us a screenshot of a character to which you'd like to see motion-capture data applied at 3dw.competition@futurenet.co.uk, putting the words 'Centroid competition' in the Subject line of your email, and including your name and daytime telephone number. (Note: please don't send us the actual model at this stage.) The closing date for entries is **7 March 2005**. If you are the sender of one of the five entries shortlisted by the judges, Centroid Motion Capture will then contact you directly, asking you to submit the model itself, rigged and ready for animation. The sender of the best rigged model will win a full day at one of the company's European studios. All data recorded during the day will be cleaned and supplied to the winner. The four runners up will each receive a Centroid T-shirt. For full details, please read the Terms and Conditions box on the left.



ABOVE: Send us a screenshot of your 3D character, and you could win a full day at Centroid Motion Capture, recording professional-quality data to bring it to life!

- Models produced in other 3D software packages will not be considered during judging. (Illustration)
- >> These rules include any set of instructions set out in the terms of this competition. By entering this competition, an entrant will be deemed to have read and understood those terms and conditions and be bound by them.
 - >> Employees of Future Publishing, Centroid Motion Capture or any other person directly connected with the competition or their immediate family will be ineligible to enter.
 - >> Persons under the age of 18 can only enter with the consent of a parent or legal guardian.
 - >> Any entry that is incomplete, illegible, late or otherwise does not comply with these rules may be deemed invalid at the sole discretion of the Editor. Proof of sending an entry will not be deemed to be proof of delivery.
 - >> By entering this competition, you warrant that the image and character model you submit is created by you, is not derived in part or in whole from any other material, and will be solely used in personal non-commercial work.
 - >> You acknowledge that Future Publishing Limited, including its employees, agents and subcontractors, is not responsible in any way whatsoever for contacting and/or supplying the prizes to the winners of the competition.
 - >> Shortlisted entrants must supply a rigged character model in *max*, *Maya*, *LightWave*, *Cinema 4D*, or *Softimage XSI* format in order to be eligible for consideration for the main prize.
 - >> If an entrant cannot be contacted by email within a reasonable period, the judge's decision, based on the content of Centroid Motion Capture, an alternative will be selected.
 - >> The entrant who is shortlisted by the judges, has submitted the most technically appropriate rigged model will win one full working day at any of Centroid Motion Capture's European studios.
 - >> The prize is non-transferable and must be taken as stated. No cash alternatives are available.
 - >> This competition is open to readers worldwide but note that all related costs, including travel and accommodation, must be met by the winner.
 - >> Centroid Motion Capture does not guarantee the availability of any data at a particular studio. The winner may be asked to specify further choices if their first choice is unavailable.
 - >> The winner has six months to acquire a date with Centroid Motion Capture. If no date can be agreed upon in this time, Centroid Motion Capture has the right to withdraw its offer.
 - >> The winner grants *EW* World magazine and Centroid Motion Capture an non-exclusive license to publish all images, animation, and other information. Your rights as the copyright holder of the character are not affected in any other way.
 - >> The decision of the judges is final. The names of the judges are available on request. No other correspondence will be entered into.



Q&A

RIGHT The final part of this two-stage Q&A deals with the creation of a volumetric nebula, and adds the option of a camera fly-through, if desired

3ds max
Supporting files for this Q&A are on the CD. Screenshots can be downloaded from the 'Stop Press' section of our website: www.3dworldmag.com

3ds max

by PETE DRAPER



"I'm creating a space scene. How do I get the starfield and nebula background right?"
Part two of a two-part Q&A



Last issue's starfield Q&A covered the initial part of this extensive project. In this second part, we'll create a nebula to complement the starfield background.

There are a few ways we could create this effect. Firstly, we could use an Omni light as a node and

generate a Fractal Fury glow post effect, which would create a smoky or electric nebula. The result isn't very convincing though – it looks very CG and uniform (unless we overlay a lot of fractal glow effects over each other to break up the uniform pattern). This might be okay for a 2D effect, but it's useless if we want to fly through the nebula because of scaling. Plus, if the light passes off camera, the effect will be turned off, almost like a switch.

Another way would be to generate a material effect in a similar way to how we created the starfield effect last issue, for example (with nested Noise, Smoke and Cellular maps). Although this would create a realistic result (with a bit of playing around with the settings) we still can't fly through

the nebula – it would either be applied to a sphere or directly to the environment background.

PUMP UP THE VOLUMETRICS

Instead, we need to utilise 3ds max's volumetric system to create some patchy clouds and illuminate them to create the desired result. But max's volumetrics are, well, nowhere near as good as *LightWave's*, to say the least. The clouds won't actually be illuminated, as there's no colour variation based on illumination – just the intensity determined by volumetric density (apart from the Fire Effect volumetric which distributes colours from inside to out and/or on timing). We'll mix multiple volumetrics together, so we can break up the uniform effect a single volumetric produces. This enables us to add detail in places, as a standard volumetric doesn't generate as much detail when set to a large size; the number of detail iterations can't be increased much, unlike in maps or a plug-in solution.

Using several volumetric lights will generate the best effect for our nebula. We can tweak the colours used in the volumetrics with a Gradient Ramp map as a projector to

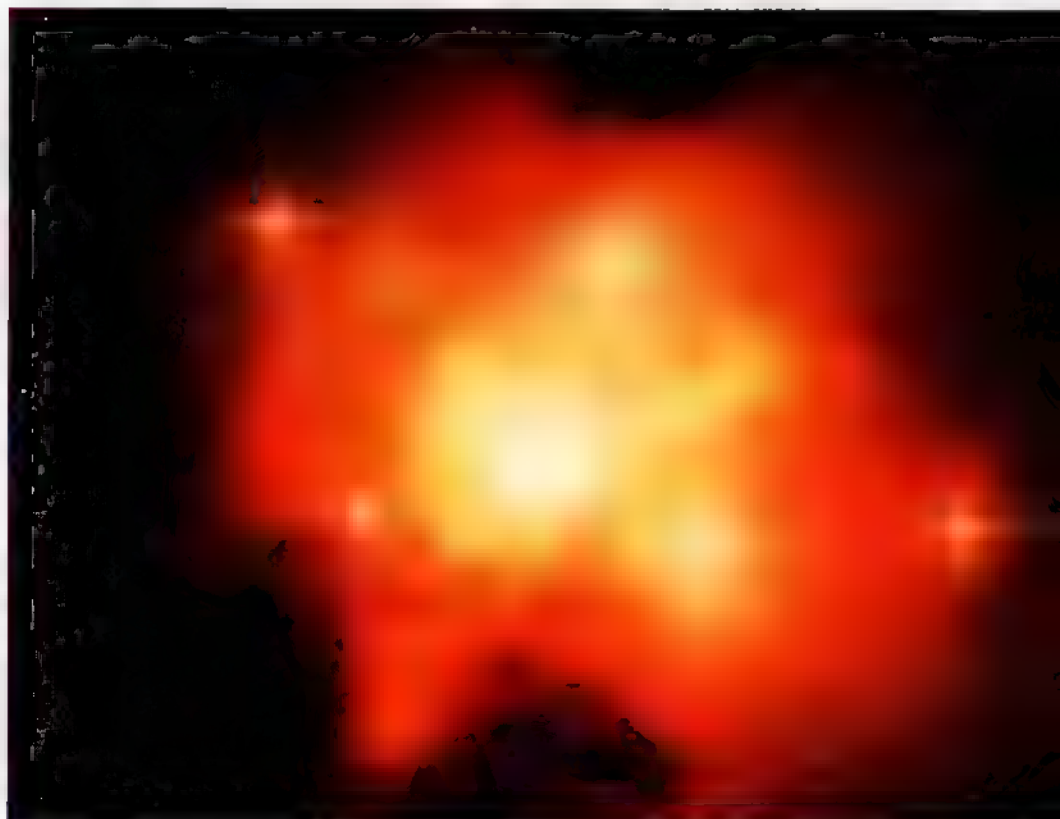
distribute colour over the cloud effect. We'll start with the core volumetric. This will act as both a base illumination for the nebula to simulate additional glow from the core, and as a large distribution of cloud break-up, by using low-density and inverted volumetric noise. This will result in patches of cloud-shaped spaces in the volumetric. Instead of just cloud and no main light beam(s). We'll then create the first of two cloud volumetrics, again using a volumetric light, but with a different attenuation setting and Noise size. This one creates smaller broken patches of Fractal cloud which, due to the order of the environment volumetric effects, are overlaid on top of the existing effect. Finally, another Noise size – this one with a Turbulence Noise effect applied to break up the distribution even more.

The result is effective but not complete without additional detail. In creating the image above, I scattered a few lights around the volumetric distribution using a test render as a guide to cloud density. I also added Glow and Star render effects to simulate intense stars distributed in and around the nebula, and also doubled up the glows on a few of them to break up the uniform glow that results with only one global render effect applied.

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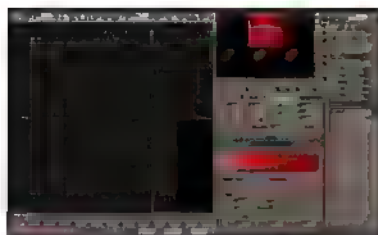


Pete is the VFX Director at *LightWork* in Bristol. He has written various books on 3ds max and is also a long-term contributor to *3D World*. He was irreversibly traumatised when Boxey was captured by the Ovnions.

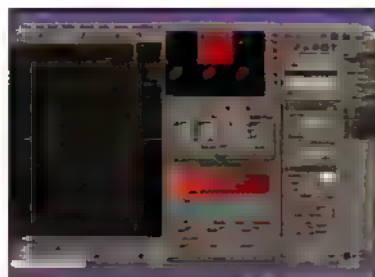


STEP BY STEP: STAR DUST

Create a nebula cloud worthy of Battlestar Galactica with these six steps, and make your scene truly out of this world



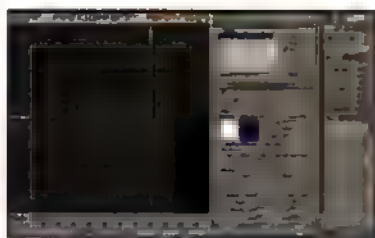
1 Open up the nebula_start.max scene included on the cover CD. Open the Material Editor and create a new Gradient Ramp map. Set the flag at position 0 to white, create a white flag at position 1, a yellow-orange colour at position 10, orange at position 30 and a darker orange-red at position 100. Set the Noise amount to 0.36, Size to 6, type to Fractal and set the Levels to 10.



2 Create an Omni light at 0,0,0 and label it 'Omni Core'. Enable Inverse Square decay, and set the Decay Start to 100. Enable Use and Show Far Attenuation and set its Start and End values to 100 and 500 respectively. Instance the Gradient Ramp map to the Projector Map slot in the light's Advanced Effects rollout.



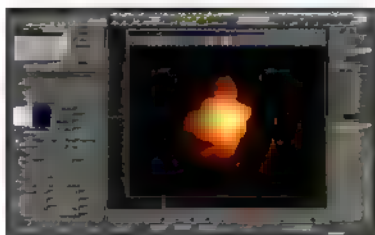
3 Copy the light and label the copy 'Omni Fractal'. Amend the Decay Start and Far Attenuation Start to 50 and set the End value to 300. Copy the light again and label the new light 'Omni Turbulence'. Set the Decay and Far Attenuation Start values to 50 and End to 400.



4 Open the Environment panel and add a new Volume Light Atmospheric Effect. Label it 'Volume Light Core'. Enable Exponential, set the Density to 7, Max Light to 100 and enable Noise On. Set the Amount to 1, Type to Turbulence and enable Invert to generate the dark patches. Set the High to 0.1, Levels to 6 and Size to 500. Click on the Pick Light button and select the Omni Core light.



5 Add a new Volume Light Atmospheric Effect. Label it 'Volume Light Fractal'. Enable Exponential, set the Density to 50 and enable Noise On. Set the Amount to 1 and Type to Fractal. Set the High to 0.4, Low to 0.35, Uniformity to 0.2, Levels to 6 and Size to 140. Click on the Pick Light button and select the Omni Fractal light to add it to the Effect.



6 Add a new Volume Light Atmospheric Effect. Label it 'Volume Light Turbulence'. Enable Exponential, set the Density to 50, Max Light to 100 and enable Noise On. Set the Amount to 1 and Type to Turbulence. Set the High to 0.5, Low to 0.4, Levels to 6 and Size to 150. Click on the Pick Light button and select the Omni Turbulence light to add it to the Effect. Render off using the Camera Viewport.

3DS MAX TIPS

Not totally satisfied with your nebula? Make it even more realistic with detail, lights and gizmos using the tips below.

01 Even though the method shown in the walkthrough gives a convincing result, it would benefit with a bit more detail. To add extra elements to the nebula, try creating a particle system with facing particles, and distribute them through the nebula to create some wispy smoke effects and trails. You might also want to try using billboard/facing particles with smoke maps applied to add extra densities where required.

02 To create star clusters and different flare types that suggest stars of different class and compositions, try adding some lights of varying sizes. These can all be driven by a few post effects, including/excluding a light from each one; or increasing or decreasing the effect by adding or removing the light from each flare element (even if all of the lights are instanced).

03 There are many scripts available to help you add volumetric gizmos (and other non-geometric items) using Particle Flow. Although these are relatively easy to code, they can be downloaded from <http://www.scriptsnet.com/bebe>. Bear in mind that this simply places a volumetric gizmo in a specific location, and does not deal with opacity control or cloud type; these still need to be set in the environment atmospheric effect as a range of different effects will still need to be created and assigned to create a more natural look.

04 A volumetric plug-in solution is available in the form of AfterBurn (from www.afterworks.com), which will produce much better effects than the standard system, offering greater control over the volumetric distribution and the ability to implement shading using lights to drive the nebula's illumination. Users can also include shadowing cast by additional AfterBurn elements to simulate dust clouds and/or distribute the entire system using a particle system, for more fluid formations.

For quick fixes to 3ds max problems, post your questions in our online forum: www.3dworldmag.com/3dsmax/

Pro tips

for animation timing

Successful animation isn't just a decent walk cycle. Hips, subtlety and, oddly, a man called Blair are the key

by Chris Romano

Friends frequently ask for tips for their 3D character animation. It's hard to offer advice because so much of it is visual and mental; you have to 'see' to understand. Skills like timing can't exactly be taught — they have to be observed and absorbed.

Computers are all about 1s and 0s, but animation is an organic process. I think animation is far closer to Art than even lighting; you have more aesthetic decisions to make when animating, more formal judgements and visual editing. Before starting, you should decide what style of animation you're interested in. What type of animation are you going to focus on? It makes a big difference, as styles vary massively. Compare action-heavy anime to squash-and-stretch cartoons by Warner Bros. and you'll see a huge difference in style. My personal focus is on cute characters. I aspire to create charming and humorous performances, my own style aiming somewhere between a no-frills Warner Bros. and a low-budget Pixar cartoon animation (hopefully someday it'll be known as the 'Toonlets style'). So don't hand me that scene full of hyper-realistic, hungry lions stalking their prey; that's outside of my realm. But that chubby little monster with the hot foot? He's all mine!

I'll talk about my animation methods in relation to my recent short *Hide And Seek*. It features two cute little robots, called 'Hulu' and 'Bohls'. I made this (despite being on full bipped, cartoon performance. I wanted it to be both action-heavy and fluid, and I wanted to make the most of their simple construction. Looking back, I think I should have cut down on the dialogue and turned up the slapstick and physical humour. But I'll let you be the judge.

CHRIS ROMANO
<http://toonlets.com>



Chris Romano accidentally fell into computer graphics in 1994. After being involved in 18 features, 25 indies and 32 commercials, Romano is still uncomfortable with his photo.



PRESTON BLAIR

Before you start, I recommend picking up copies of Preston Blair's two books, *How to Animate Film Cartoons* and *How to Draw Cartoon Animation*. They're indispensable. Read them cover to cover, copy the examples and photocopy the diagrams: every time I start a new piece, I crack open the books and use them for reference.

A SENSE OF TIMING

Amateur animation quite often suffers from being too slow, missing the mark, and looking as if there's something that's not quite right. The best thing you can do is watch Bugs Bunny cartoons. No, seriously. Record them and watch them over and over in slow motion. Study how Bugs and co. act and react. Really examine their poses and look at how much they bend and stretch. It'll also help if you take notes.

Get to know your timeline. I work exclusively at 24fps which is the same speed that films are made at. I tend to over-use the four frame action. When animating a robot raising his arm from point A to B in four frames, I'll make him anticipate for four, move in four, overlap in four and dampen in four. It just seems to work for robots but it isn't a universal formula by any means. Surprise actions anticipate in two frames, for example, and bigger actions take place in six or eight frames. I usually start with four and then adjust accordingly. Use your visual sense of timing to determine what looks right – it's better to be too fast than too slow. Fast is funny – look at Benny Hill. OK, bad example.

GET TO THE POINT

Don't over-do your movements. Obviously when a character walks or jumps, his entire body moves, but it's usually all moving around the same action. Make sure you keep your action clear, concise and subtle. Making a character try to do too much in a small amount of time will come across as confusing, muddled and very amateur. If in doubt, show your work to others and see what they think. If they ask, "What's he doing?" then you'll know you've made a mistake somewhere and you can go back and fix it.

YOU'RE NOT A PERSON TALKING, YOU'RE A PERFORMER ON STAGE. GESTICULATE! PRETEND YOU'RE AN OLD-TIME ACTOR IN A SILENT FILM. HAMMING IT UP

IT'S ALL IN THE HIPS

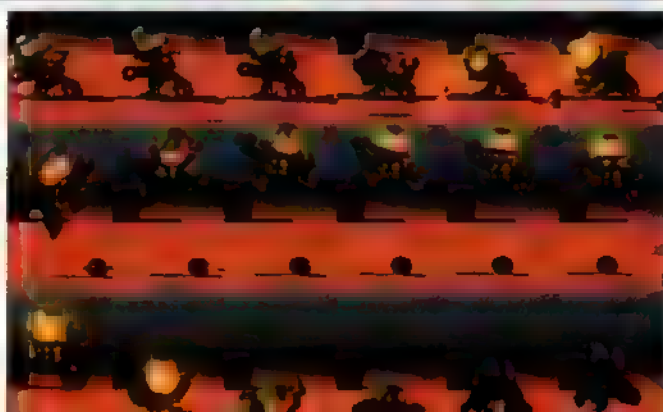
When you're ready to get started on your action (and you've done your storyboard), it's a good idea to start with the hips. Generally the hips lead,

and everything else follows. If the hips are wrong, the whole action will look awkward. Even when animating a character falling, spinning or jumping, get the hip action right first, and fill in the limbs later: turn off the arms and legs, and just animate the torso. Be mindful of weight and gravity and all that and remember, hips animate in every axis: X, Y, and Z. In shots with a lot of speech, the hips are subordinate to the dialog. The timing, emphasis, and direction of the body's motion is led by the timing, the emotion, and the drama of the words. The body language of an angry character is decidedly different from someone who's scared, for example. >>



ABOVE In this sample of frames, Nuts' dialog has him shaking left and right for emphasis. The energy of his dialogue drives his body language

RIGHT Here, Nuts anticipates his jump in two frames, by crouching low. But instead of immediately leaping, he holds on to this position for two more frames, before shooting upwards. He then hangs for six frames before crashing back down. Although the entire jump takes 12 frames, there are actually only two frames of real travel



FEATURE

DON'T BE AFRAID TO ACT OUT

Read your dialogue in front of the mirror and study your movements as closely as possible. Really act it out: you're not a person talking, you're a performer on stage. Gesticulate! Pretend you're an old-time actor in a silent film, hamming it up. Use it to drive your character's performance.

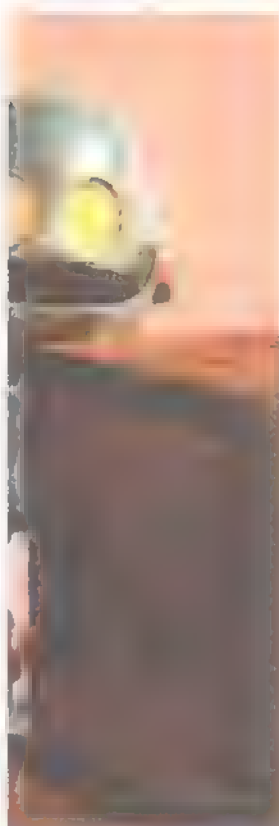
HITTING POSES

Make your poses visually interesting within each frame. Envision the silhouette and make formal decisions. Break up the space with your character and the environment. The rule of thumb here is to hold a pose for as long as you can, animate to the next pose as fast as you can, and hold it there for as long as possible. Remember to anticipate and overlap your actions, no matter how subtle. It's all a matter of degree: even tiny actions have reactions, they're just smaller.

In *Hide And Seek*, the silver robot jumps in reaction to an exploding bomb. I massaged this animation many times, making the anticipation and the zenith of the jump last as long as possible, trimming as many frames as I could from the actual ascent and descent of the jump. In the end, I think his jump is funnier and far more emphatic.

FILLING IN THE LIMBS

With your hips animated, fill in the legs and adjust the hips accordingly. But don't be lazy. If you need to add a frame here or there to make the timing perfect, then do it: don't skimp. One important lesson I learned was from hearing [Senior



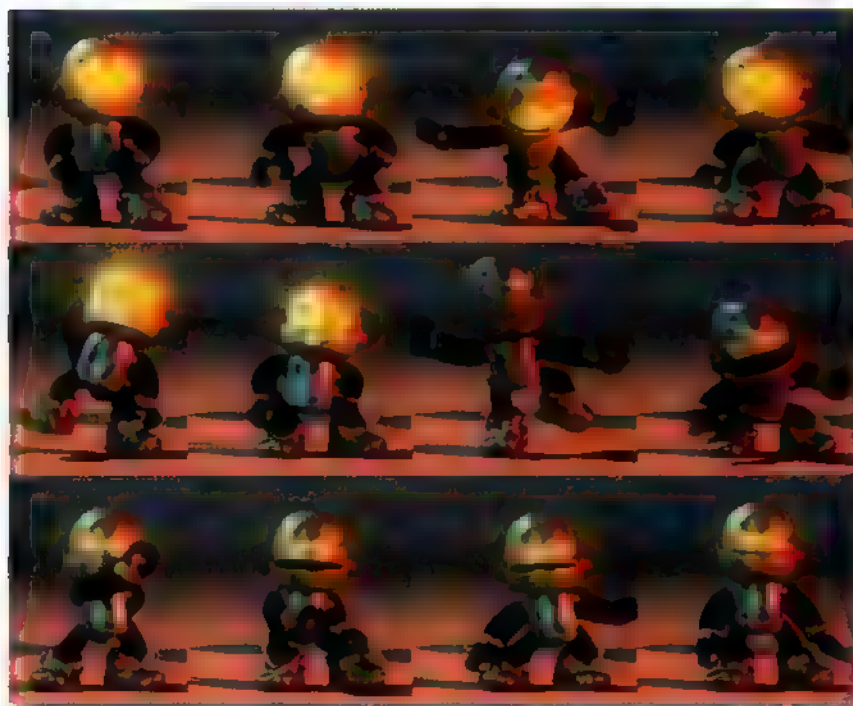
Animation Supervisor] Bill Kroyer declare that we needed another frame when working on *Rugrats in Paris: The Movie* together. "One frame?" I thought, "You're kidding!" But it makes a difference. Don't be afraid to key every frame, and don't rely on the computer to inbetween for you. Sometimes you can get away with it, but other times you'll really need to get in there and key everything. It all depends on the action and detail.

After you've got the legs animated, you can fill in the arms. Make sure you keep the arms and legs offset. If you're right-handed, keep your left hand a frame or two behind - it's the same for the legs - one leads and the other follows.

CYCLES

For cycles, I follow the Preston Blair charts (see the first tip). Take the ten frame walk cycle and double it, creating a 20 frame cycle to get in more motion. (For example: drawing 1 = frame 1; drawing 2 = frame 3, drawing 5 = frame 9; mirror of drawing 1 = frame 11; mirror of 5 = frame 19, back to 1 = frame 21). Add your own flair, depending on the mood (sad, happy, and so on). Of course, at 24fps, a 20-frame cycle is slow. When you're happy with the poses, scale the timing. Speed it up accordingly, perhaps down to 16 or 14 frames.

My keyframes usually shift to ugly numbers, fractions of frames, but I don't care. It's better to be too fast than too slow. Sometimes you'll need to clean up the contact points of the feet as a result of the time shift, but only do this when it's visible from camera. I don't like cycles. There are four in



ABOVE In these consecutive frames, we see Bolts' 13-frame run cycle in action. This cycle was animated with more frames and then sped up in the Graph Editor for better timing. This is one of those times where I had to edit the feet after the time scale to ensure visual contact with the ground.

LEFT In this sample of about every fourth frame, we see how Nuts' hips lead all of his action. This is one of those scenes where I'd turn the arms and legs off, animate the hips first, and then fill in the limbs later.

RIGHT In order to emphasize Nut's slower 'searching' movement, this slow walk cycle takes 28 frames. That's over a second per cycle.

FAR RIGHT I copied Nuts' victory walk from the trot of a spoiled little boy I saw at the mall. I had to walk in front of the mirror repeatedly to remember. My wife thought I'd gone mad!

Hide And Seek, and each is used only once. For the most part I'm happy with them. However, it pains me when I watch Bolts run. I should have followed my own advice, scrapped the animation, and started over. As a personal rule, I won't use the same cycle twice if I can avoid it, and I try to make each cycle distinct

CAMERA ANIMATION

Don't abuse the camera by using it too much. Save camera moves for when you need them. the camera should accent your character work, not detract from it. You'll notice that good animation has a lot to do with subtlety: cut your animation like live action. Cut back and forth between characters. Don't swing the camera around all willy-nilly. Embrace conventional editing. No one likes the 900 frame free-floating camera move and it's the first sign of a newbie

LISTEN TO OTHERS AND BE BRAVE!

This is always the hardest part of every project: listening to others' constructive criticism with an open mind. It's pretty disheartening when you've spent so long on a project to find that your tester is confused by an action or thinks something's awkward, but chances are they aren't stupid.

Take a deep breath, step away from the situation, and try to review your work with a fresh eye and as objectively

LISTENING TO OTHERS' CONSTRUCTIVE CRITICISM IS ALWAYS HARD. BUT IF SOMEONE'S CONFUSED BY AN ACTION, CHANCES ARE THEY AREN'T STUPID.



as possible. If you realise something just isn't working, don't be afraid to scrap your work and start again. Animation is time consuming, but it's better to spend the time on it and end up with an animation you're happy with than waste time trying to fix something that's lost.

CHARACTER SET UP

I set up all my own characters, and I insist on keeping the tools simple for animation. Each robot has hip, arm, and leg controls, a control for the head, and a control for the face (mouth and eyes). When it comes to the claws (they open and close, spin and rotate) I include these channels on the arm control, along with the elbow twist. The hip control also includes the bend, twist, and lean of the spine. Don't bog yourself down with poking through a hierarchy: keep your tools easily accessible.

Edit the rotation order to minimise Gimbal lock as a default X,Y,Z can be a problem. If you spin 90 degrees in Y, X and Z suddenly end up rotating over one another which is horrible. I much prefer something like X,Z,Y or Z,X,Y. Don't be afraid to experiment, but bear in mind that you can only change the order before animating. If you change the rotation order afterwards it will result in an unpredictable animation.

After a character is initially set up, do a test animation and use all the controls. Get to know the set up and make sure it functions just as you want. Spend time fixing problems and getting it just right. In the end, you'll be glad you did. ■



Q&A

RIGHT *Maya's Dynamics and Rigid Bodies may look good, but when it comes to getting what you want they can be a real pain in the arse. This Q&A shows you how*

Supporting files for this Q&A
Supporting files for this Q&A are on the CD. Screenshots can be downloaded from the 'Stop Press' section of our website, www.3dworldmag.com

Maya
by **GARY NODEN**



"I want to create an animation of falling glass balls smashing to bits on the ground. How do I make it look realistic using dynamics?" **ADAM | via email**



Since the early days, dynamics have been an integral part of 3D. While films such as *Shrek 2* and *Shark Tale* draw vast crowds of people to the cinema on the strength of their content, rather than their technical wizardry, these films would seem incomplete if it weren't for the effects. *Toy Story's* Woody may have his forehead burnt by Sid's magnifying glass, but without the trail of smoke coming from it, the burn wouldn't look right – or as funny. Sully from *Monsters Inc.* would have been harder to accept as a convincing character had his fur stuck out at right angles to his body. Instead of possessing such a dynamic nature. And it's these beautifully 'random' forces that complete a piece of computer animation.

Dynamics, however, can be a double-edged sword. Their random nature is just that: random. Your control of a dynamic element is surrendered the moment you hit the play button – what seemed like a good idea at the time often becomes a waiting game of collisions and rigid

body interpenetration. Setting up dynamics to produce your desired effect can take as long as it would have done to animate it by hand in the first place. The process becomes a tweaking exercise to find out how each change affects the outcome of your scene setup: in a production environment you're often working to a tight deadline, and of course, no matter how wonderful your dynamics look to you, your client will often want you to change one element whilst keeping the rest as they are. No, the true power of using dynamic forces is knowing when to stop.

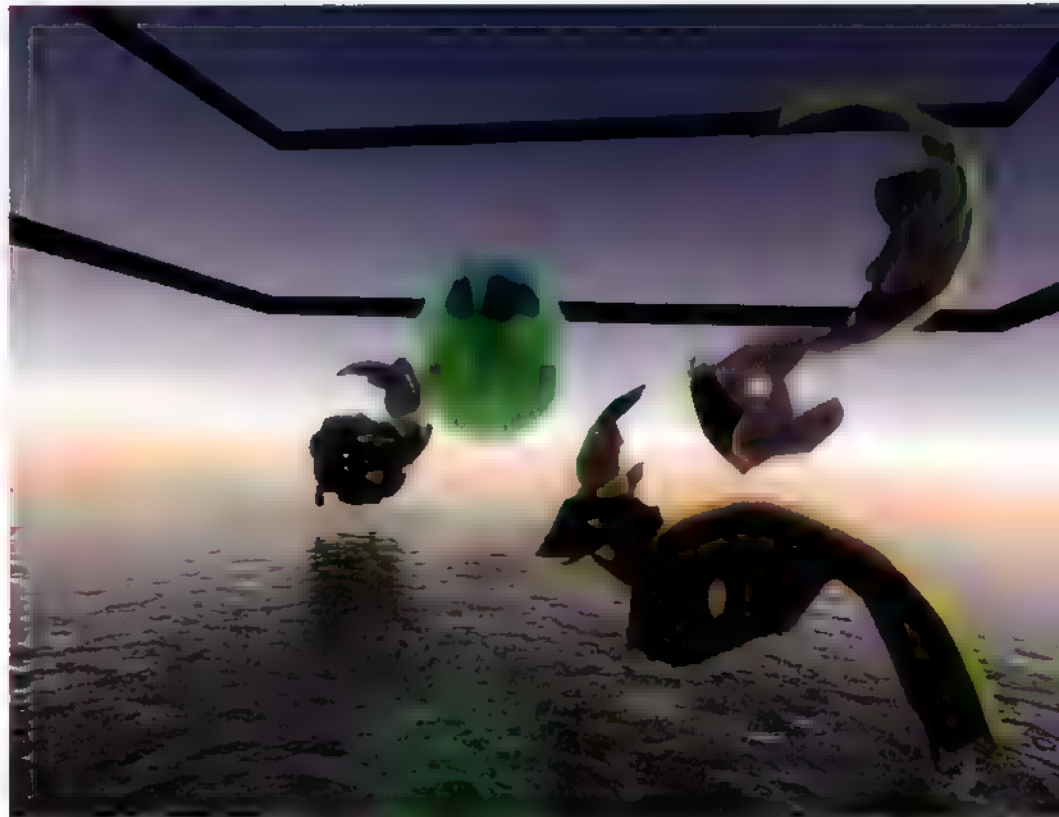
CONTROL TWEAK

Dropping a glass ball and getting it to break is a classic example of knowing when to stop the dynamics. For one thing, you can't break an object on contact with a surface: in order to create the effect of an object breaking on contact, you have to break it into pieces first. These shards are then given an active 'rigid body' property so that they can be moved by dynamic forces such as gravity, wind, and turbulence, and ultimately collide with another object. It's when this group of shards comes into contact with its

collision target that the breaking up appears to happen, making it look as if the object has been broken by its fall.

From a global camera view you can get a reasonable effect without too much tweaking. But often, when a camera is close to dynamics, you can see the tiny twitching of objects as the forces continue to re-jig their position. So if you want one of the shards to fly right at your camera, you should stop the dynamics and start animating. *Maya* has a tool that 'bakes' animation curves from objects that are controlled by dynamics. This leaves objects that have keyframes that duplicate what the dynamics do. So, after baking dynamics, you're left with something that can be adapted and improved.

This isn't a coward's way out of using dynamics, by the way – it's the only way to control something inherently uncontrollable. Imagine a (fictional) movie, featuring a tornado ripping up a motorway. Cars are whipped into the air by dynamics, a truck flies off at a tangent, and crashes down inches from the camera. Dramatic stuff! But, although the motion of the truck may have started as a dynamic effect, getting it to land where it did would almost certainly have to have been hand animated.

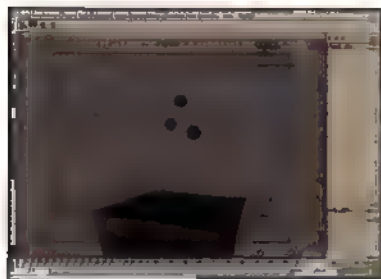


GARY NODEN
www.422.com

Gary Noden is head of 3D at 422 in Manchester in the north of England and has been working as an animator for eleven years. He was once accused of doing a good job by someone who should know better.

STEP BY STEP: BUSTIN' OUR BALLS

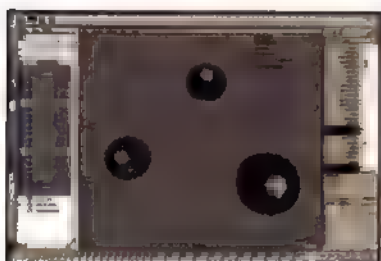
Dynamics are the key to getting a ball to smash. Our six steps should get the ball rolling – or should that be breaking?



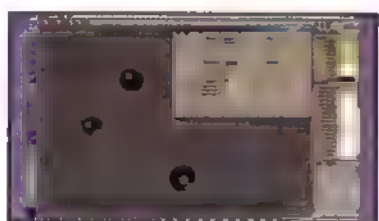
1 Open up `multiball_1.mb`. There are three balls hanging above a polygon surface. Around them is a templated group of square frames. These are for later – ignore them for now. Change your main menu to Dynamics and then select your three balls. Now open the Effects > Create Shatter > Options box.



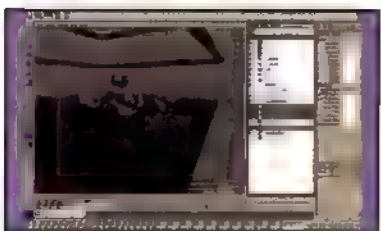
2 Select the Surface Shatter tab, and set the post operation to 'rigid bodies with collisions off'. Set the maximum shard count to a figure less than 10 (I used 7). Now click Apply and wait. After a while you'll see three surfaceShatter nodes appear in the Outliner. Each is a group of shards that make up the same shape as your original objects.



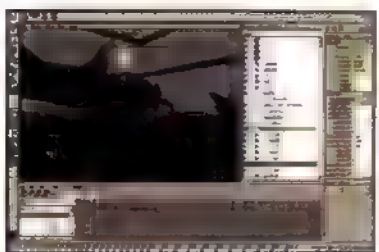
3 Hide the original balls. Open the Plinth group and select `plinthCollide`. Apply `Ball/Rigid Bodies > Create Passive Rigid Body`. Select all the shards in one of the viewports and set the rigid body's collisions flag to On, and set the dynamic friction to 0.2 to 0. Set the Apply Force At to VerticesOrCvs. This will help reduce interpenetration issues. Now press Play.



4 This is the first dynamic simulation of your balls smashing. Edit the values of the Rigid Bodies and the surfaceShatter's initial positions until you're happy with the results. When you're happy, go to frame 1, and select all the shards. Open `Edit > Keys > Bake Simulation > Options`. In the Channel box, select translate and rotate channels of your selected objects. In the Options box, change All Keyable to From Channel Box then hit Apply.



5 When the simulation has finished, reselect all the shards and set the active flag of their rigid bodies to inactive: no need to delete them. Now you can scrub in your timeline and see the baked dynamics in real time. Add a camera, and animate it to follow the falling balls as they smash. Untemplate aroundForMotion to see the balls moving against something. Or just load `multiball_5.mb`.



6 Now we'll edit one of the shards. In the scene, select a piece of shard that looks close enough to the camera. Open the Graph Editor. Now, scrub through the timeline until you find a point where you want to animate from. In the Graph Editor, remove all of the points after this and, making sure to use linear interpolation, animate the piece towards camera.

MAYA TIPS

If you're still a little unsure about dynamics and how to use them, here are some absolutely smashing tips. Sorry.

01 Never set up a complicated object as a rigid body unless it's absolutely necessary. The best way to make a polygon or NURBS-heavy piece of geometry move with dynamic forces is to make a very simple dummy that follows the contours of your object. Attach your complicated object to the dummy and make the dummy the rigid body. This way, wherever the dummy goes by dynamic forces, the elaborate one will go too – but much more quickly than it otherwise would have done. Then hide or template the dummy's shapeNode and you're ready to render.

02 Dynamics simulations are automatically calculated from one keyframe to the next. This is why with short animations where you want a stream of particles left behind a rocket, for example, you get a staggered line of blobs that bears little resemblance to your emitter's animation curve. You can solve this by increasing the oversampling of your dynamics. Open `Dynamics > Solvers > Edit Oversampling or Cache Settings`. Setting the sampling to higher value than 1 effectively creates more calculation points for the dynamics. A value of 2 samples at 1.0, 1.5, 2.0, 2.5; a value of 4 samples at 1.0, 1.25, 1.5, 1.75, 2.0 – and so on. Changing the oversampling value also means you have to change the playback rate from 1 frame to 0.5 for 2, 0.25 for 4 and so on.

03 Baking simulations on rigid bodies is obviously a good way to make animating quicker. Thankfully, particle dynamics can also be baked in the form of a particle cache. When you're happy with your particle effects, select your particle and open `Solvers > Create Particle Disk Cache`. If your timeline is maximised, you should be able to just hit Apply. This saves information on everything dynamic about your particles in a folder in the project's particles directory.

For quick fixes for Maya problems, post your questions in our online forum:
www.3dworldmag.com/maya

Q&A

RIGHT Subpolygon displacement selectively adds polygons to create 'true' displacement without the wasted polygons of regular displacement mapping

SUPPORTING FILES
Supporting files for this Q&A are on the CD. Screenshots can be downloaded from the 'Stop Press' section of our website, www.3dworldmag.com

Cinema 4D

by ADAM WATKINS



"What's all this hype about Subpolygon displacement in R9 of C4D? Why should I use it instead of regular ol' displacement?"

JOHN BAIN (via email)



Subpolygon displacement (SPD) is the newest feature that everyone 'must have' in their software application. Whether it's really needed or not is largely subjective but the technology is powerful, and could be just the tool you need for an upcoming project

In the days before SPD, if you wanted to allow an image to actually alter a poly-mesh, you had to use Displacement maps. Displacement maps should not be confused with a Bump map. Bump is a sort of faux technique in which the render engine 'paints' the surface as though it actually had a tactile Bump on it. However, when you looked carefully – and especially when you looked at these poly-meshes in profile – you could see that there was actually no change to the shape and arrangement of the polygons. With a Bump map the silhouette of a golf ball is still perfectly smooth: no dimples, and therefore reduced realism.

The benefit of a Bump map is that the 'faux technique' can make a low-poly surface appear to have many more

polygons (and more detailed geometry) than it actually has. However, because of the aforementioned silhouette limitations, displacement is often the tool of choice as geometry is actually moved or displaced according to a greyscale image. The benefit of displacement is that the resulting silhouettes have distorted geometry, that holds up well under closer inspection.

DISPLACEMENT ACTIVITY

In order to displace geometry, there obviously must be geometry to displace. If an object is low poly (or a parametric primitive), displacement doesn't work very well – or at all. Instead, for it to work effectively, there must be a lot of geometry. This creates high polycounts, which means long rendering times and loss of revenue. But apart from the long rendering times, asking your video card to push around so many polygons as you work with your model can make things so slow that your workflow drags to a crawl.

Because SPD is a solution based on materials, you needn't worry much about your polygonal topology to

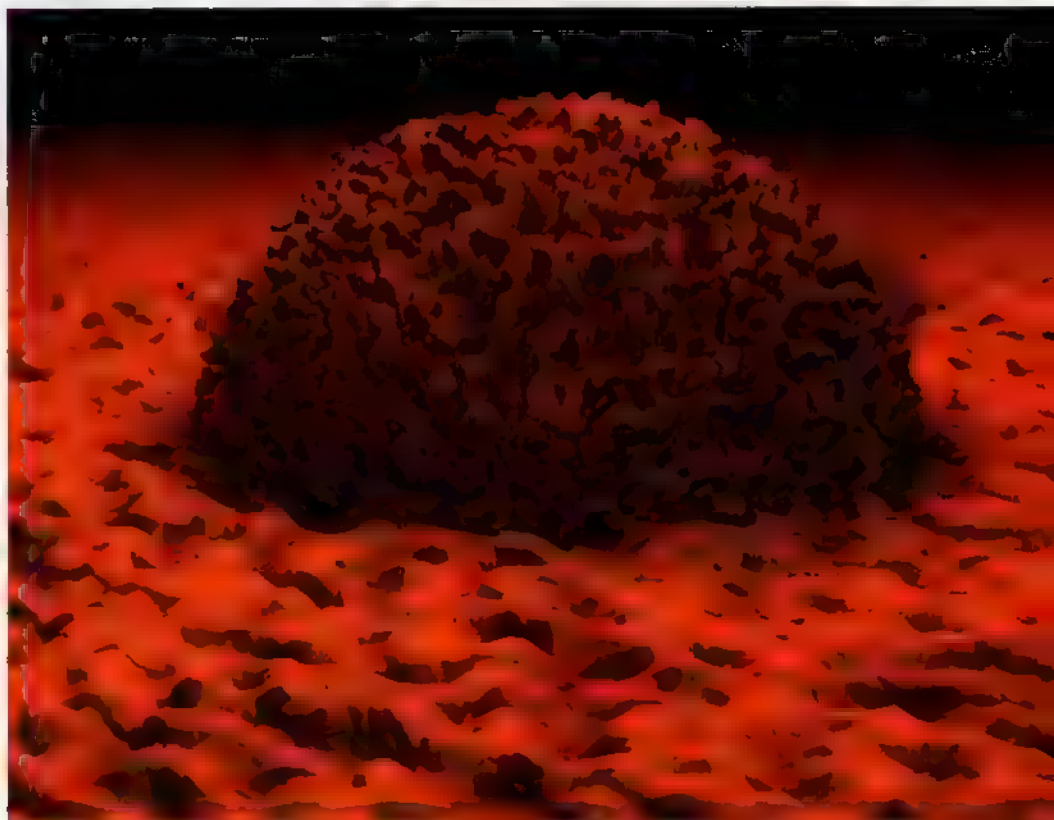
make use of it. SPD attempts to let you work with low-poly models but still use images to displace polygons. What actually happens is that the software subdivides a polygon to give you the necessary polygons to create the detailed displacement. It does this during the rendering process – which means you can work with low poly models, and work through your design decisions without being bogged down with the geometry.

Another benefit is SPD's ability to selectively add geometry in the areas it needs to. So if you have a Displacement map that has areas of high detail (high displacement), and other areas that are flat, SPD will only subdivide the geometry in the areas it needs to. In the long run, this could save a great deal of time in the rendering process as you could save thousands (even millions) of polygons on a given complex surface.

But this doesn't mean the end of all of displacement problems. It still takes considerably longer to produce a scene using SPD than a Bump map. Still, the ability to avoid unnecessary polygons in your scene (and to have a speedy interface) makes it a formidable technology. In the right project it could save you loads of time.

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Adam Watkins lives in Texas, where he is the Director of Computer Graphics Arts at the University of the Incarnate Word. He is also the author of several books on *Cinema 4D*, *Maya* and other 3D subjects.

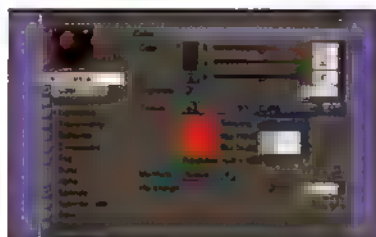


STEP BY STEP: OUT OF PLACE

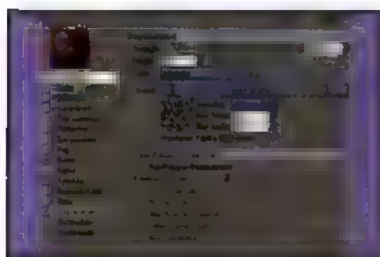
For realistic silhouettes, it's time to wave goodbye to Bump maps in favour of the rather snazzy Subpolygon displacement



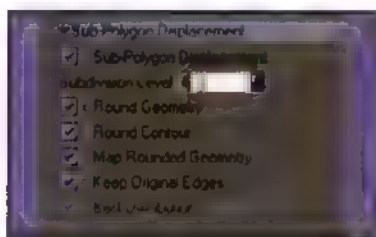
1 With the Subpolygon displacement feature, you don't need to worry a great deal about the polygon count. You can build using the polygons that the model requires (or that bones or other deformation objects need), sit back and let SPD worry about the necessary geometry.



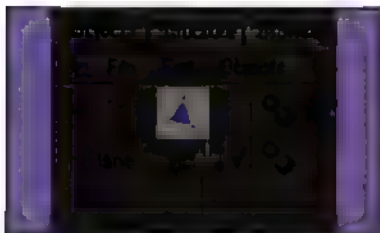
2 Start out by setting up a material in the way you normally would. All the channels (or for the other characteristics you're looking for) should be activated. Be sure you create all the Texture maps you need for these channels. Do keep in mind that your Displacement map will work best if it corresponds to other maps (the Colour map, for instance).



3 Subpolygon displacement works through the Displacement channel, so activate it now. Import the texture map that you're planning to use to displace the polygons. Although the Displacement channel will actually use any image (including colour images), greyscale images are often the easiest to control and visualise.



4 Towards the bottom of the Displacement channel interface is the new Subpolygon displacement area. This is only available in the new R8 release. Here, you can activate the function, and determine how many times you want C4D to subdivide the polygons to get the newly added geometry to displace. The higher you set this value, the more detailed the displacement, but the longer the render.



5 An important thing to note about Subpolygon displacement is that (like regular displacement) you need to have an unadulterated polygonal mesh or NURBS surface to work with. In your Objects Manager, the object that is to have the SPD-based material must be working with the sort of icon shown above (indicating a polygon form). SPD will not work with parametric primitives.



6 It's now time to render. If your scene is complex enough, C4D will tell you that it's working through the calculations needed to create the SPD. At the bottom left of the Render External Viewer or the general interface when you click Render View, you can see the added work C4D is doing. If your 'Preparing Displacement' becomes inordinately lengthy, you may want to consider reducing the Subdivision Level in the material.

CINEMA 4D TIPS

Read these handy tips to find out when, where and how to use Subpolygon displacement in C4D

01 I know I said you didn't have to worry about polygon topology, but actually, that's not entirely true – you just have to worry about the topology less. With the main image shown on the left, a simple plane forms the ground. If that plane were one single polygon, then even with a Subpolygon displacement-based material that had a Subdivision Level of 4 (high in most cases) the material would only have 256 polygons to work with. This is usually not enough to get any sort of reliable displacement. In order for Subpolygon displacement to produce enough polygons to displace, it has to have a decent number of polygons to begin with.

02 You could get around this by turning the Subdivision Level up to something like 8. And for a one-polygon surface, this might be just the ticket. However, if you use that material on objects other than the single-poly plane, you'll get a lot more polygons than you need. Indeed, you'll add so many polygons through the subdivision process that the rendering will take forever. Being able to distribute a controllable number of polygons is usually the ideal way to get SPD to work its magic.

03 As with all digital images, the one you use to define the SPD will be reliant on the number of pixels available when it gets ready to sub-divide a mesh. The higher your resolution, the higher the detail may be when C4D uses SPD. Of course this is a complex issue, and is tied closely to the number of sub-divisions you are using. But, if you need a detailed displaced mesh that holds up under scrutiny, you'll not only need a high sub-division setting, but a high-resolution texture map. Conversely, if you're not looking at a given surface very closely, there's no need for a huge texture map. Images with too high a resolution will often end up looking similar to lower-res images, but render faster because C4D has less data to deal with.

For quick fixes for Cinema 4D problems, post your questions in our online forum: www.3dworldmag.com/c4d

TUTORIAL

BLUESCREEN ON A BUDGET

Think that good-quality bluescreen effects can only be created on a Hollywood budget? Then think again. We show you how to make your own bluescreen studio and drop actors into 3D worlds for less than \$100. Lights, Camera, Action!

BY CHRISTOPHER KENWORTHY

For almost no cost, and with a little care, a homemade bluescreen can enable you to create shots worthy of a Hollywood blockbuster. Software has improved to the point where even Mini DV footage creates good results, as long as you build a good quality, evenly lit bluescreen.

Home-built bluescreen studios (which can be packed away when not in use), are frequently used on low-budget films, and even in commercials and corporate videos.

In this tutorial we'll show you how to build your own bluescreen studio; one that gives you great results in minimum time. By using matchmove markers you'll be able to film handheld shots and camera moves around your actor, a technique normally reserved for the wealthiest studios. Finally, we'll show you how to composite your actor into a 3D scene in *After Effects*.

One low-budget approach is to buy white material and dye it blue (or paint a canvas) but this can lead to uneven colours. A better approach is to buy at least ten metres of bright blue material. Just make sure that it's smooth, opaque and not glossy – tracksuit material works really well (the thick cotton kind, not towelling). The more movement you want to shoot, the bigger the space you'll need, so make sure you plan ahead. Walking shots, for instance, require much more room; and fight scenes need even more than that!

Your bluescreen studio needs to be well lit, with no outside light (because sunlight registers as blue), so you'll need a good-sized space that can either be blacked out or used only at night. Basements and garages can be good, but these tend to accumulate lots of dust – you need a room that's pretty clean as dirty footprints will soon make your screen totally unusable.

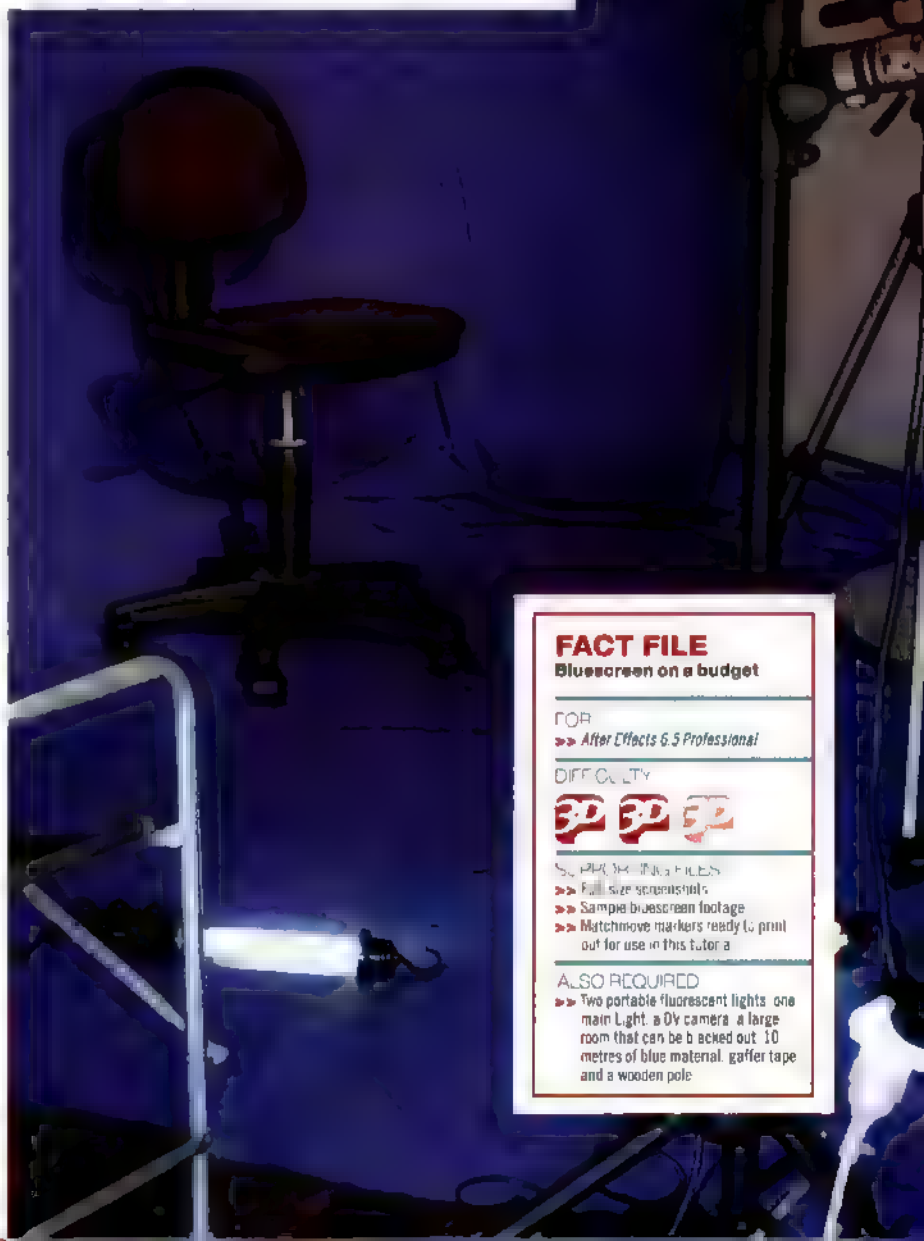
Ideally, you should build the studio at a close proximity to your computer, so you can load and test footage as you shoot. You'll notice that using the Keylight filter (in *After Effects Pro*) can yield stunning results, but keying is an art more than a science, and every shot will require experimentation and creativity. So don your Spielberg cap, and get ready to create a mini blockbuster.

CHRISTOPHER KENWORTHY

<http://homepage.mac.com/thoughtfox/index.html>



Writer/Director Christopher Kenworthy was born in England, but now lives in Australia. He has won a short film festival, been sent to the Cannes Film Festival, and written for several television shows. He also specialises in low-budget visual effects.



FACT FILE

Bluescreen on a budget

FOR

>> *After Effects 6.5 Professional*

DIFFICULTY



SKIPPING FILES

- >> Full-size screenshots
- >> Sample bluescreen footage
- >> Matchmove markers ready to print out for use in this tutorial

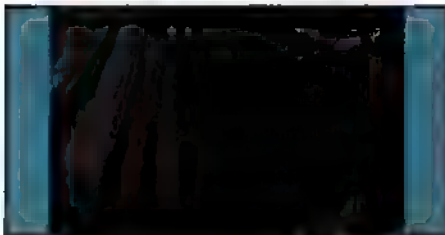
ALSO REQUIRED

- >> Two portable fluorescent lights, one main light, a DV camera, a large room that can be blacked out, 10 metres of blue material, gaffer tape and a wooden pole

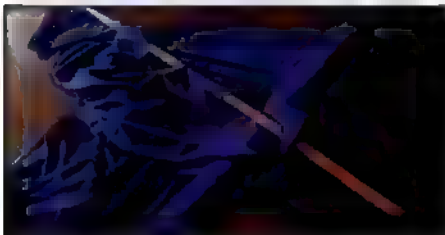
>> PART ONE

Building the screen

Drape blue material in a draught-free space, and your studio is almost built



1 Your DV camera sees sunlight as blue, so you'll need to black out the windows. Any stray sunlight will make keying close to impossible, so working at night is the quickest solution. If you want to shoot in the day, tape cardboard to the outside of windows, and drape black material over the inside. With the lights turned off, your room should be completely dark.



2 Cut your blue material into sheets that are roughly three metres in length. Cut holes along the top, and thread the pole through them, as you would with a curtain. Secure the pole against a wall, or overhanging the edge of a wardrobe. The cloth will be heavy, so you'll need to secure it firmly – a few books won't do. A good solution is to put up several stick-on hooks.

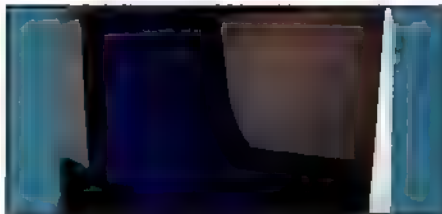


3 Material usually comes in widths of just over a metre, which won't be wide enough for most bluescreen work. When you thread your pieces of material onto the pole to get the required width, you'll need to seal the joins. Don't sew them together, as you may want to drape them separately, over furniture, steps or other objects. Instead, get behind the screen and seal the joins with gaffer tape.

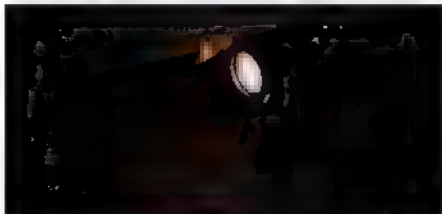
>> PART TWO

Shadows and light

With your material in place, you need to ease out the creases and smooth the lighting



4 Your material will stretch across the floor, so that actors can be shown full-length, with their feet in view. Rather than pushing the cloth back into the edge of the room, drape it forwards so you have a smooth transition from wall to floor. When you look through the camera, there should be no visible edge where the cloth meets the wall. Secure the end of the cloth to the floor with gaffer tape.

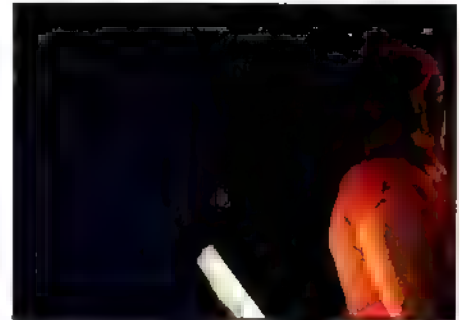


5 If you have access to proper film or photographic lighting, it'll make this project a lot easier, but you can get good results with household lights. Your main light should be placed to one side of the actor, high up, pointing down. This casts shadows onto the floor, rather than onto the bluescreen. Another light at the front, softened with greaseproof paper, will fill in the shadows caused by the first light.

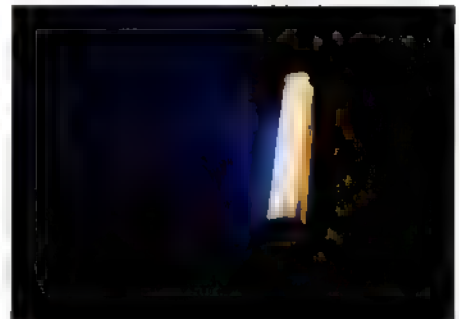
EXPERT TIPS

GREEN OR BLUE

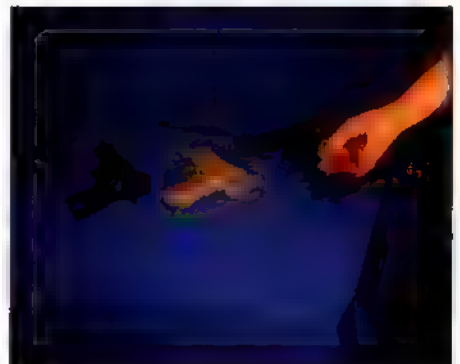
>> In Hollywood, both coloured screens are used, according to the actors, sets and costumes. If your actor has blue eyes and wears jeans and a blue shirt, use a greenscreen. But if your actor is wearing green, but has blue eyes, you should use a bluescreen, and use After Effects to animate a mask around the eyes. If you can't block out all the daylight, a greenscreen is best.



6 Portable fluorescent lights are excellent tools on a bluescreen set. Place one just behind your actor, to add a rim of light. This slight halo prevents blue spill from the screen, and separates the actor from the background, making keying much easier. You can tape lights to chairs or stands, just out of shot.



7 As you begin lighting, you'll notice wrinkles and shadows in the screen. Take the time to even these out as well as you can: every slight shadow or wrinkle will make keying more difficult. Although the software can do a lot of the work for you, the more evenly lit your screen, the fewer adjustments will be required – and the less likely you are to run into problems.



8 If you want your actor to interact with the environment, you'll need to create dummy props and drape them with blue cloth. Here, a table has been covered with a cloth, and the guns have been placed upon it. The 3D table doesn't have to be the same shape or size as the bluescreen table, as long as the surface is at the same angle. You can also use this technique to cover steps.

TUTORIAL

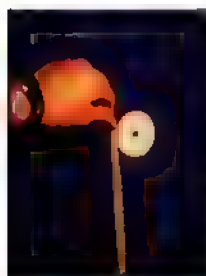
>> PART THREE

Matchmoving

Carefully placed markers will allow you to move a 3D background behind your actor



9 Open the MatchMove.jpg file. Print out several copies of the markers and cut them out. You'll use *After Effects* to track the black dot, which shows up well against the white. Although a larger black dot may be useful if you're a good distance away from the screen, you should use a black dot that's as small as possible – if it's too large, it won't track as accurately.



10 You can use your matchmove markers to record the position and rotation of the bluescreen in relation to your actor. Two markers will be used for this at any one time, and both markers should be the same height above the floor. Use a tape measure for accuracy, then use paper glue to hold them in place.

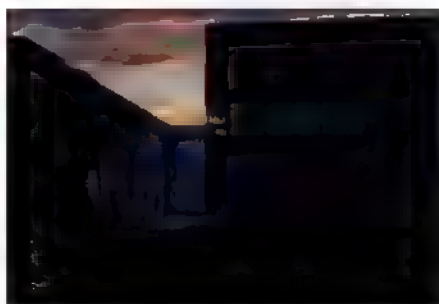
EXPERT TIPS

ANCHORING JUDGEMENTS

>> When you're working with a 3D background, you need to make sure that the background is anchored to the camera. This means that the background should move in the same way as the camera. In this example, we use a matchmoving marker to track the camera movement, and then use the marker to anchor the background to the camera.



11 Practise your camera movement so that the markers remain in view at all times. In this example, we move around the actor until she faces us more fully. The markers remain in view throughout the shot so you may need to adjust them as you develop the shot. Don't worry if the white area goes out of view – it's OK as long as the black dot remains fully in view.



12 Before shooting, it helps to have an understanding of the background, and where the light is supposed to be coming from. In this example, the Street scene was created first. You can work the other way around, and adapt the 3D scene to suit your on-set lighting, but best results are found by having an idea of the end shot in mind from the outset.



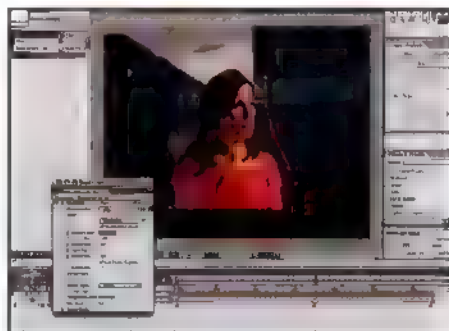
13 Using matchmove markers you can shoot a handheld shot, moving close and around the actor. Ordinary bluescreen work has to be carried out on a tripod with no camera movement, but you can make elaborate camera moves, as long as both markers appear in shot. Practice a few times before finally shooting. Avoid over-fast movements that will blur the markers too much.



14 Load your footage into *After Effects*, and select Track Motion. Check the position and rotation boxes, and track two parallel black dots. In this example, we used the higher markers: you often get the best results by using markers placed at roughly the same height as the camera.



15 Track the motion and then Apply to the background plate. In this case the Street.tif. The camera shake and rotation is now accurate, but you need the background to slide across as the camera moves around the actor. To do this, adjust the Anchor points. At the start of the shot, the Street scene should be anchored to the left – you may need to scale it up a little to prevent the edge showing.



16 As the real camera moves to the right, drag the anchor point so the Street layer slides to the right. Click the Motion Blur box for the street layer, and use the Keylight filter to key out the blue from the bluescreen layer. The combination of recorded camera shake and rotation, with the sliding layer, creates the illusion of a real 3D interaction between actor, background and camera.

>> PART FOUR

Colour correction

With the basics done, you need to colour-match your images, and smooth out the matte



17 Apply the Keylight filter, and then use the Eyedropper to select an area of the bluescreen. Most of the blue will vanish, but there will be a slight blue haze around the edge of the actor, the remains of shadows where the lighting wasn't perfect, and the matchmove markers. You can animate a mask tightly around the actor to get rid of these surrounding artefacts, but don't mask yet. A full image is easier to work with.

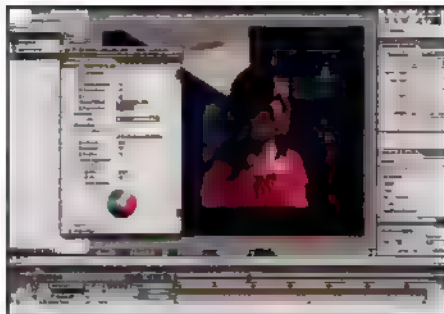


18 Change the Keylight filter's View mode to Status. Making adjustments in this mode will show you how the filter works. Black areas are made transparent, while shows foreground, and grey is the border between them. In adjusting Screen Strength, Balance and Clipping, try to get a narrow gray band around a white subject.

EXPERT TIPS

COLOUR SEPARATION

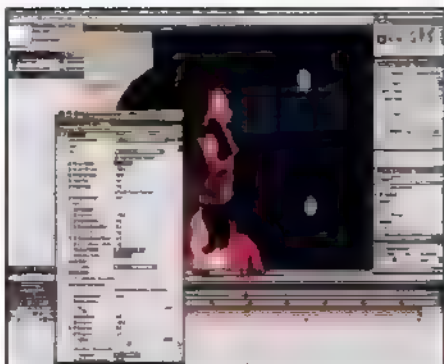
>> When lighting for a movie, your actor shouldn't blend into the background. This can be prevented by making your actor brighter, and blurring the background. You can also improve the result by making the actor look slightly more colour-saturated than the background. When compositing, don't spend all your time trying to match the actor perfectly to the background. If you get a better look with a slightly more saturated actor. For the shot to work, you should make reference to the rest of the film. If your actor always stands out, keep it to 'real' shots, then create the same look when compositing.



19 Open the foreground Colour Correction tab, and reduce the Saturation to about 80. This more closely matches the background saturation. Drag the Colour Balance marker slightly towards blue, to shift the hue to match the street scene. When matching foreground to background, concentrate on skin tones, rather than clothing.



20 Open the Edge Colour Correction tab, and check Enable Edge Colour Correction. Make adjustments to the Softness and Grow of the edge. Be wary of over-perfecting a still image. After you've made some adjustments, create a RAM Preview to see how this matte works when moving. If it flickers or leaves gaps, you need to keep working. Set Edge Colour Suppression to blue, to remove blue spill.



21 Using Edge Colour Correction you can increase the Brightness of the actor's edge, to make them appear backlit. This makes the matte work more effectively. The overall result, although not realistic in scientific terms, looks more like a perfectly lit Hollywood shot.

>> PART FIVE

Refining the composite

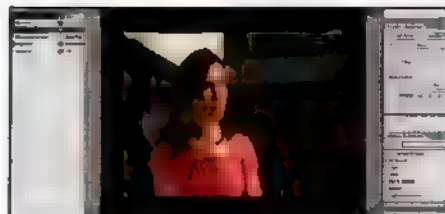
Good results can be achieved in moments, but take the time to perfect your composite



22 If you watch the clip back, you'll notice that every adjustment you make affects every other setting. You may find that you can now reduce the overall Screen Strength, or Pre-blur. Occasionally, switch off the filter and watch the raw clip: you may find that you've lost a lot of hair detail. It's important to check the original image to see what you're trying to bring to the composite.



23 Although the Street layer will have Motion blur, you can also add a Gaussian blur, to simulate the depth of field blurring of a real camera lens. Again, don't worry about the science as much as the end result - sometimes, sharp is better. When you've worked for a while, leave the shot and come back later. It's easier to judge a composite after a break.



24 You can export the finished shot, re-import, and add masks and filters. Here, a 16:9 widescreen filter is added to match the original bluescreen footage. Blur and glows are also added. You achieve a more blended result by adding these to the completed shot, rather than to each layer ■

Q&A

RIGHT The richness of the surface's colour is achieved by using a mixture of nodes. While their effect might be subtle on their own, they do make quite a difference in the final image

SUPPORTING FILES
Supporting files for this Q&A are on the CD. Screenshots can be downloaded from the 'Stop Press' section of our website, www.3dworldmag.com

XSI
by **OLA MADSEN**



"I'm trying to set up a material for a DNA molecule, but my attempts appear rather dull and flat. Can you help?"

MATTHEW WEST | via email

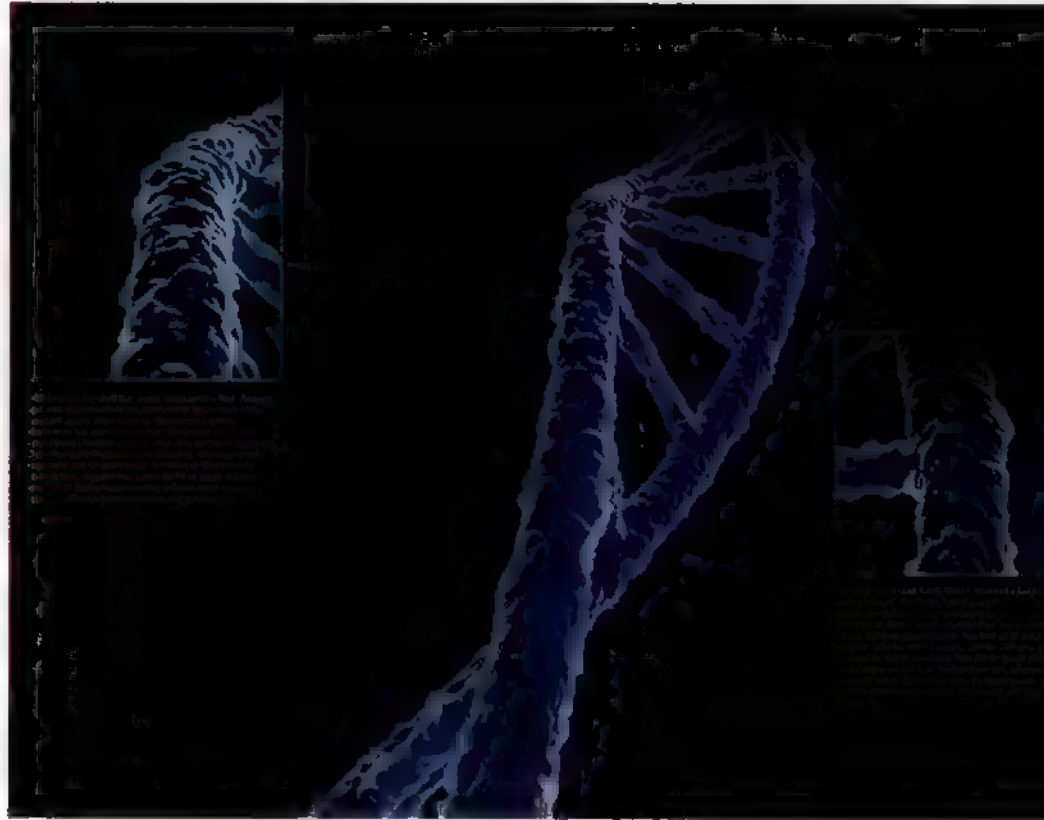


If you browse through medical image libraries, you'll see many different popular styles in which to illustrate DNA. Choosing which style (and colour too, for that matter) to use isn't merely an artistic choice, though. It depends whether the purpose of your illustration is to provide any kind of truthful biological information, or if it's simply a striking image. Here, I'll approach the shading in a broader, more general way – our texture nodes of choice and their values are by no means an exact science, and should rather be used as guidelines. This should give you some general insight and will allow you to modify your material to suit your specific needs.

Even though you might prefer the control gained when working with painted textures, there are many situations where procedural textures are so useful and this is surely one of them. As conventional images are resolution-dependent, you can only scale them so much before they start falling apart – the procedurals don't

have this drawback. This is a crucial issue when it comes to setting up Bump and Displacement maps, as the deformation of the surface relies on the colour values retrieved from the texture.

As you zoom in on the object, at a certain point artefacts will start showing in the image (due to the resolution being too low). These miscalculations will be carried on to the displacement of the surface, creating unwanted effects. You should also be aware of how Bump and Displacement mapping is handled by XSI. By default, all shades brighter than pure black will push the geometry outwards from its original position; completely black areas will remain unaffected. This isn't really what you want, so you'll need to make some adjustments. You only want the areas that are brighter than 50% grey to push the geometry outwards, whereas those with a value less than grey should be pulled inwards. Furthermore, you want a mixture of several textures to drive the displacements, creating irregularities with different shapes and sizes. While these are rather straightforward to achieve in the Render Tree, the solutions might not be completely obvious. Bear in mind that,



In order for the displacement mapping to function properly, you need to set the appropriate parameters in the Geometry Approximation property page of the object. And, while this is already taken care of in this Q&A, these settings will have an impact on the quality of your displacement as well as on the render time, so it's something that you definitely should try tweaking on your own.

LIVING COLOUR

To get a good variation of the DNA's colour, we'll make use of a couple of different techniques. First you need to blend the main diffuse colour depending on the surface's angle, in relation to the lights in the scene. Give the strand a coloured volume, before finishing it off by making parts of it appear slightly self-illuminated. The geometry's shading is primarily obtained from mixing nodes in the Render Tree rather than requiring any complicated setup of different light sources. The Render Tree can quickly become cluttered, so if you get lost somewhere along the line you can look at the finalised Render Tree in the scene DNA_final.scn until you feel comfortable creating your own.

OLA MADSEN
www.digitalcontext.se



Ola Madsen is working as 3D artist at a company in Sweden. He animates everything from medical treatments to cute furry teddy bears and DNA strands. He was genetically engineered for his superior drinking abilities.

STEP BY STEP: GENE POOL

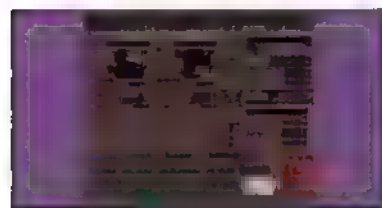
Be a mad scientist and do your own genetic modification. The steps below allow you to create DNA: the blueprint of life



1 Open the DNA scene. As you can see, there are two deformers applied to DNA strands. First we have the Twist deformer that twists it around its own axis. The second deformer is a Path deformer, which enables you to alter the overall shape of the string by moving the points on the curve. Adjust the parameters until you're happy with the string's appearance, and set an appealing camera angle.



2 Apply a Lambert shader. Set Ambient to black. Open a Render Tree; get an Incidence (Nodes > Illumination) and a Mix 2 Colors (Nodes > Mixers). Connect the letter to the Lambert node's diffuse input. Set Base colour to R:0.207 G:0.256 B:0.7 and Mix Layer to R:0.984 G:0.256 B:0.7. Connect the Incidence node to the weight input and open its PPG. Change Mode to Surface/Lights. Set Bias to 0.15, Gain to 0.95 and check the Invert box.



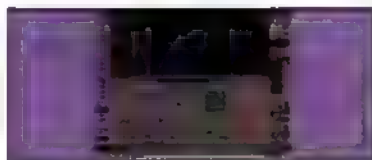
3 To give the string a sense of volume, in the Lambert PPG, set the Transparency to a light grey (RGB: 0.7). Get the following nodes: State > Scalar state, Math > Change Range, Math > Scalar Exponent and another Mix 2 Colors. Connect the Scalar state to the input of the Change Range node. In the PPG, set the New Range: Start to 0, the End to 0.5 and connect this to the Scalar Exponent. Change the operation to Logarithm, lower the Factor to 0.01 and connect this to the weight input of the Mix node.



4 In the Mix PPG, set the Base colour to a dark blue (R: 0.055 G: 0.207 B: 0.496), the Mix Layer to pure white, and connect the node to the Volume input of the Material Node. The surface of the DNA is still too dull. To fix this, apply two different displacement maps, one for the broad deformation and a second to add a bit more detail.



5 Get the following nodes: Nodes > Texture > Rock, Mixers > Mix 2 Colors, Image Processing > Color Correction and finally a Math > Change Range node. Open the Rock node's PPG. Set the Grain Size to 0.75, and the Diffusion to 0.1. Under the Advanced tab, change the UV maximum remap to 1. Connect it to the Mixer node's Base colour. Copy the Rock node and invert colours 1 and 2. Set Grain Size to 0.2, Diffusion to 0.1 and connect it to the Mix node as colour 1. Connect the Mix node to the Colour correction's input. Lower Contrast to about 0.15.



6 Connect the colour correction to the input of the Change Range node. Set the New Range: Start to -0.5, and the End to 0.5 before connecting the branch to the Displacement input of the Material node. Go back to the Rock nodes and apply a Spatial texture projection. As a final touch, open the Lambert PPG. Under Indirect Illumination, set the Incandescence to a light blue colour. Click on the Connection icon next to the Intensity slider and choose Incidence. Check the Invert box in the PPG and your DNA string is completed.

XSI TIPS

Examine the microscopic world of DNA more closely, and organise your project better, with these helpful tips

01 Trying out different settings in the various nodes can become a bit tedious as the complexity of the tree increases. To speed up your render times, preview only the nodes you're working on. For example, if you're trying to sort out your preferred values for the Rock node, there's really no need to calculate the displacement, volume and colour of the object. Disconnect all the nodes from the Material and plug in the Rock branch directly to the Surface input. This will allow you to shade your object with a correct representation of your settings, but at a fraction of the render time. In the early versions of XSI you could preview the branch you were working on at the click of a mouse button. The Hotkey was removed due to stability issues, but you can still reactivate it in the Keyboard Mapping menu inside of XSI. While it's a great time saver, do note that it was removed for a reason and might not be completely safe to use: handle with care.

02 As you start adding nodes to the Render Tree, it doesn't take long before they start piling up and finding the right node becomes wishful thinking. To keep track of your nodes, it's a good idea to get into the habit of naming them – preferably with a naming convention that makes sense. Not only will you regain overall control, but when you open an old material, you'll understand the purpose of each node in the tree.

03 While we made use of the Rock node for the displacement of the surfaces in the walkthrough, you can get a wide range of differently shaped patterns by using any combination of the other procedural nodes. However, you're not limited to only making use of the procedurals, as you can mix and match them with standard textures/images as well. Go to www.softimage.com or you could also try www.xsibees.com for additional nodes developed by people in the user base.

For quick fixes for XSI problems, post your questions in our online forum: www.3dworldmag.com/XSI

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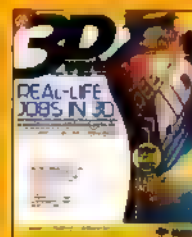
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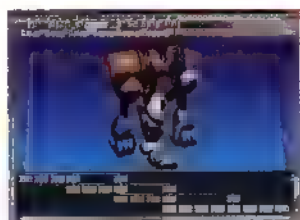
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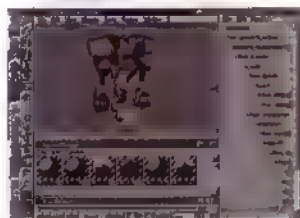
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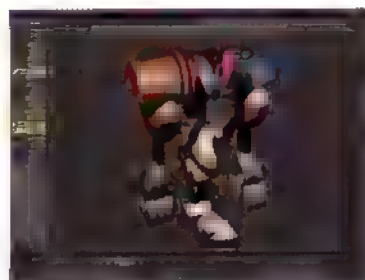
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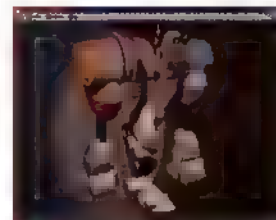
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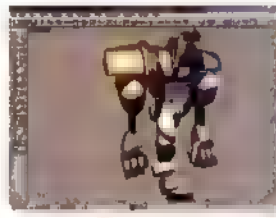
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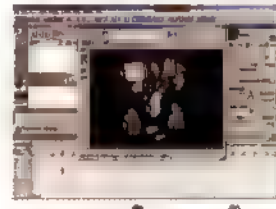
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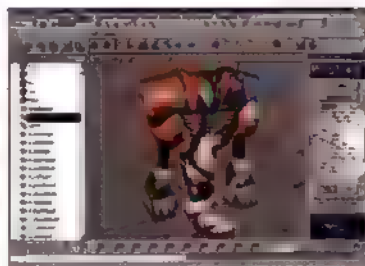
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Example
"CAD to DCC"
conversion. Unigraphics
to Lightwave. Converted and
optimized by PolyTrans. © 2004
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HACH Odyssey DR/2500 Spectrophotometer.

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REVIEWS

Carrara 4

Carrara 4 delivers functionality and affordability but still maintains its ease of use

BY MIKE DE LA FLOR

PC/MAC

PRICE

- >> Pro £311* (\$679)
- >> Standard £150* (\$279)
- >> Upgrade: £64*-\$101* (\$119-\$189)

*Currency conversion

MINIMUM SYSTEM

PC

- >> Windows 98/2000/XP/ME/NT 4.0
- >> Pentium II 300MHz
- >> 128MB RAM
- >> 300MB HD

MAC

- >> Mac OS 10.1 or later
- >> Power Macintosh G3 266MHz
- >> 128MB RAM
- >> 300MB HD

- >> Improved Terrain Editor
- >> New Realistic Sky
- >> Improved Inverse Kinematics
- >> Enhanced Morph Targets
- >> Blurry Reflections
- >> Motion blur and Vector motion blur
- >> Eovia Chain network rendering
- >> Sounds Support
- >> Scene manipulators
- >> Improved motion paths

[01] Every version of Carrara has delivered improved modelling tools – even if the improvements have been modest. The Vertex Modeler (in Carrara 4) has a revised interface with different modules for modelling, animation and UV mapping

[02] Carrara 4 finally delivers vastly improved Morph Targets, making facial animation much easier to handle

DEVELOPER EOVIA, INC

WEB WWW.EOVIA.COM

CONTACT INFO@EOVIA.COM

The main difference between Carrara 4 and previous incarnations is that Carrara 4 ships in two versions – Professional and Standard. Carrara 4 Standard is a skimmed-down edition of the Pro version with some higher-end features (such as network rendering and motion blur) trimmed out. For the price, though, the Standard version is ideal for a beginner on a budget, as it delivers comprehensive modelling, animation, and advanced features such as, raytracing, GI, Morph Targets, IK, as well as sophisticated terrain and sky generators

Eovia has always provided Carrara users with exceptional rendering tools. In fact, it's often set the standard in rendering technologies in its price range. Once again, Eovia has managed to raise the bar by enhancing the realism of Carrara's renders with true 3D motion blur, Vector motion blur and Blurry Reflections for realistic shiny surfaces such as, metals, plastics and tiles. Both Standard and Pro versions feature advanced, raytraced GI for indirect lighting, Sky Dome lighting with HDRI support, and caustics. But, if you aren't in the mood for ultra-realism Carrara's Non-Photorealistic render engine will produce dazzling sketched and painterly images and animations.

Long-awaited features making their debut are Network rendering and an Alpha channel in the Shader tree. The Eovia Chain



IMAGE © Larry de la Flor

01

Network Rendering (in the Pro version only) distributes rendering tasks across a local network allowing up to five computers to work on images and animations. Both versions come with the new Alpha channel in Shaders that allow objects to be seamlessly masked and faded.

Carrara 4 comes with much improved animation tools. At last, the kinks have been worked out – the Motion Path tools allow smooth and fluid animations, and the Morph Targets actually work to facilitate facial animation. Both versions come with the new Create IK Chain tool, which allows users to painlessly build an IK hierarchy at the click of a mouse button. Booleans have been a sore topic for users for quite some time, as they've not worked predictably. But in version 4, Boolean functions in the Assemble Room and Vertex Modeler are much improved and work well. Unique to the Pro version is support for BVH and FBX mo-cap file formats, which makes creating complex animation such as walking, running and kicking a doddle.

In the past, Carrara's modelling tools have been found lacking when compared with the competition. However, Carrara Studio 3 fixed several bugs and provided minor enhancements, and Carrara 4

continues the trend of modelling improvements. The Vertex Modeler sports an improved interface with separate modes for polygonal modelling, UV mapping, and

for BBoxes and Morph Target animation. Fortunately, when you buy the Pro version it comes bundled with the award winning Amapi 7 Designer, which is an extremely capable polygonal and NURBS modeller.

If modelling hasn't been its strongest strength in its built-in environmental modelling and animation tools. The new Terrain Editor features an improved interface with real-time feedback, and many more options for generating realistic Earthly or alien terrains. You'll still find the old Sky Editor, but Carrara 4 also features a new Realistic Sky Editor that creates stunningly realistic clouds and skies – which can be

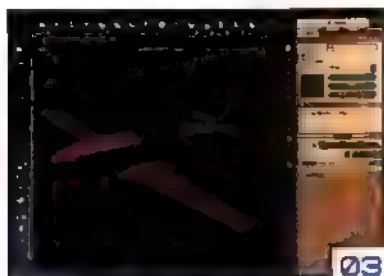
AT LAST, THE KINKS HAVE BEEN WORKED OUT – THE MOTION PATH TOOLS ALLOW SMOOTH AND FLUID ANIMATIONS

IMAGE © Jack Whitney



02

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03

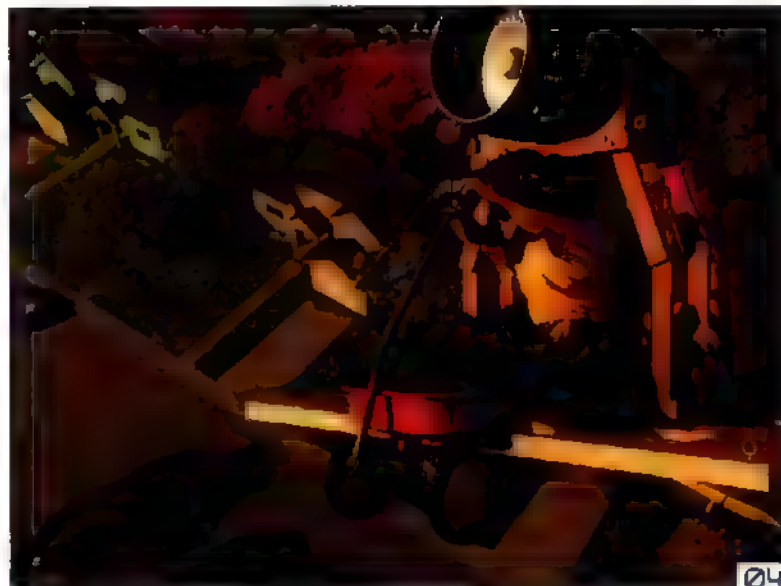
fully animated. With the Tree/Plant modeler, improved Terrain Editor and Realistic Sky generator, Carrara offers a complete solution for environmental modelling and animation.

Notable workflow improvements include scene manipulators for intuitive interaction with scene objects, support for LWO and COB file formats (in the Pro version only), and a vastly redesigned Timeline. With Carrara 4 Pro you also get a Sounds Support feature which allows sounds to be added to a scene in their own track in the Timeline, and output with the animation to movie formats such as QuickTime and AVI.

PANIC ROOM

Eovia has kept the concept of 'rooms' to organise the 3D workflow. For example, all modelling is carried out in the Model room, texturing in the Texture room and so on. Although the rooms help with workflow organisation, new users may need some time to get used to Carrara's unique interface.

And talking of beginners, in recent years, expensive 3D programs have been steadily reduced in price, to the point where they're now in competition with Carrara. Eovia's goal has always been to provide users with affordable, fully featured 3D software, so how does Carrara compare to the competition? The base price for Cinema 4D is \$695, which sounds great, but if you want to use indirect



04

IMAGE © Mark Bremner

lighting, HDRI or caustics you'll have to buy a module called *Advanced Render 2* at \$495. Particles, UV mapping, network rendering is all extra, so the complete cost of Cinema 4D is actually closer to \$2,300. Similarly, quite a few other programs, such as SoftimageXSI *Foundation*, can be seen as bare-bones versions of the more expensive editions.

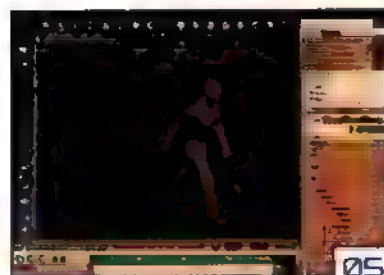
Even though Carrara 4 comes fully stocked with many advanced features, there are a wide array of plug-ins to help you handle specialist tasks. For example, Eovia's *TransPoser*

imports complete Poser scenes and animation data into Carrara. A favourite is Eovia's *Power Pack*, with plug-ins for hair, fur, Displacement mapping, advanced Shaders and the like. Both Carrara 4 Standard and

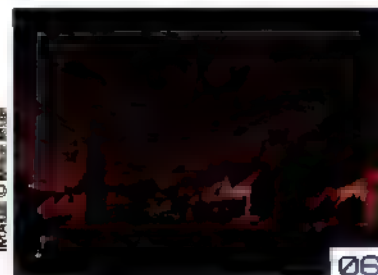
Pro ship with printed manuals, tutorials and loads of models and Shaders. For the price, both are great value, and if you factor in the shallow learning curve and ease of use, along

with the improved modelling and animation features, Carrara 4 becomes a valid solution for a range of 3D tasks. ■

FOR THE PRICE AND ITS EASE-OF-USE, CARRARA 4 IS A VALID SOLUTION FOR A RANGE OF 3D TASKS



05



06

3D VERDICT	
RANGE OF FEATURES	7
VALUE FOR MONEY	9
PROS Advanced rendering with true motion blur >> Bugs fixed >> New animation tools	
CONS Rooms interface can take some getting used to >> Modelling tools could be improved	

03 Eovia has enhanced Carrara's workflow with the addition of Scene Manipulators and a redesigned Timeline

04 Carrara's advanced rendering, with new true 3D motion blur and improved animation, allows artists to easily create stunning images and animations

05 Carrara 4 ships with the new IK Chain tools, which facilitates the sometimes tedious job of building an IK hierarchy

06 Carrara 4 features a redesigned Terrain Editor, a new Realistic Sky generator, dedicated Tree Modeler and specialised Shaders for creating ultra-realistic earthy or alien scenes

modo

Does Luxology's new modeller have the power to subdivide and conquer?

BY STEVE JARRATT

PC/MAC

PRICE

- >> £481* (\$895)
- >> Launch offer price: £374* (\$695)
- *Currency conversion

MINIMUM SYSTEM

- PC
- >> Win 2000/XP
- >> Pentium IV, AMD Athlon
- >> 512MB RAM
- >> 100MB HD
- MAC
- >> OS 10.2.8
- >> G3, G4 or G5
- >> 512MB RAM
- >> 100MB HD

MAIN FEATURES

- >> Sophisticated N-Gon Subdivision Surface modelling
- >> Edge, vertex, polygon editing
- >> Action Centre-based workflow
- >> Completely customisable UI
- >> Tool Pipe for combining multiple actions
- >> Comprehensive selection system
- >> Real-time, interactive Falloff guides
- >> Inline documentation and video tutorials

[01] One of *modo*'s clever features is its interactive Falloff system, which enables you to attenuate the effect of a tool, based on a sphere (or cylinder or vertex map) of influence. As you move the Falloff centre, so the mesh updates in real-time

[02-4] *modo* comes with three built-in UI layouts: the default quad-view, a simplified version with integrated *Tool-Source* menus, plus a dedicated layout for editing UV maps

LUXOLOGY, LLC

WEB WWW.LUXOLOGY.COM

CONTACT +1 850 378 8506

There are so many established 3D apps on the market, most of which enable you to both model and render, you might wonder why anyone would want to enter this arena at all – let alone with a

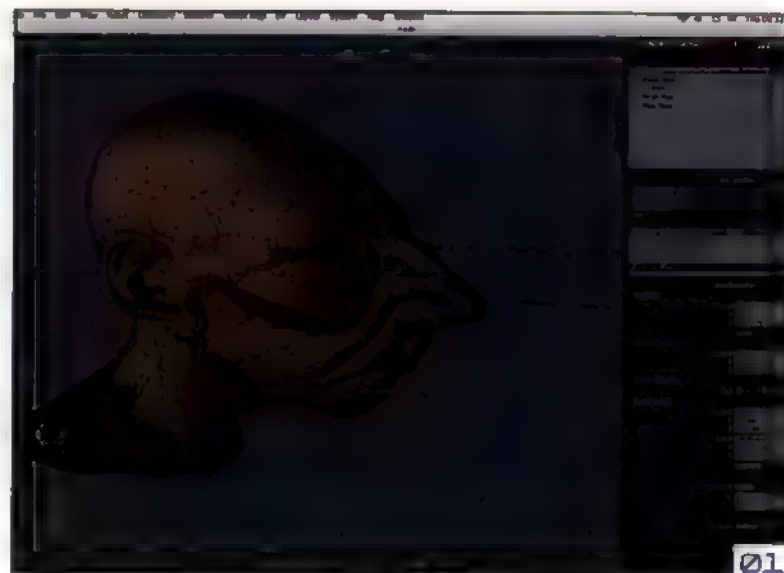
relatively expensive, modelling-only application. Yet Luxology has done just that with *modo*, its cutting-edge Subdivision Surface modeller

Developed by former members of the *LightWave* 3D engineering team, it's no surprise that *modo* takes more than a few cues from NewTek's modelling app. Even in its native form, *modo* will feel strangely familiar, thanks largely to its layers individual tools and even the occasional keyboard shortcut

But comparisons are mainly skin-deep. *modo* has been constructed from the ground up around the core principles of the modelling process: when creating or altering a 3D mesh, the biggest hurdles are selecting the bits you want to work on and then getting them to move in the right direction. As such, *modo* operates around the concepts of Selections, Action Centres and Falloff

As well as using the Cursor and Lasso tool, *modo* incorporates algorithms to intelligently add further vertices, polygons or edges based on existing selections. If you pick two adjacent polys, for example, and then hit [L] to select a contiguous loop. Alternatively, you can Grow and Shrink the selection to expand or contract the group, or use the left/right cursor keys to add or remove additional adjacent loops. And if you pick a series of alternate polys and hit the up/down cursor keys, *modo* then tries to expand the selection based on this pattern. With this technique, applying changes to a large array of elements can be more or less painless.

As with *LightWave*, you can cycle through vertex, edge or polygon selection using the space bar, which is also used to drop a tool or quickly change to another element by



right-clicking on a point, line or mesh face, though in practice this can be a little fiddly.

With a selection made, *modo* then offers up a number of Action Centre options, which enable subsequent modelling operations to be made from your chosen location

be it the scene axis, the object, its pivot point or the average location of individual elements. This makes it easy to make further changes to a mesh once it has been moved and rotated;

subsequent actions can be aligned along a polygon's normal – or more usefully, along the individual normals of a collection of polygons – which removes all the guesswork out of the editing process, and avoids

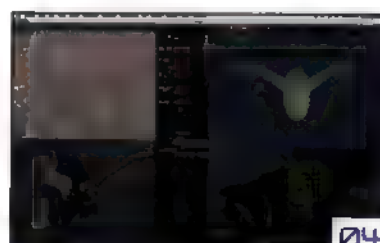
having to just eyeball changes using the perspective view

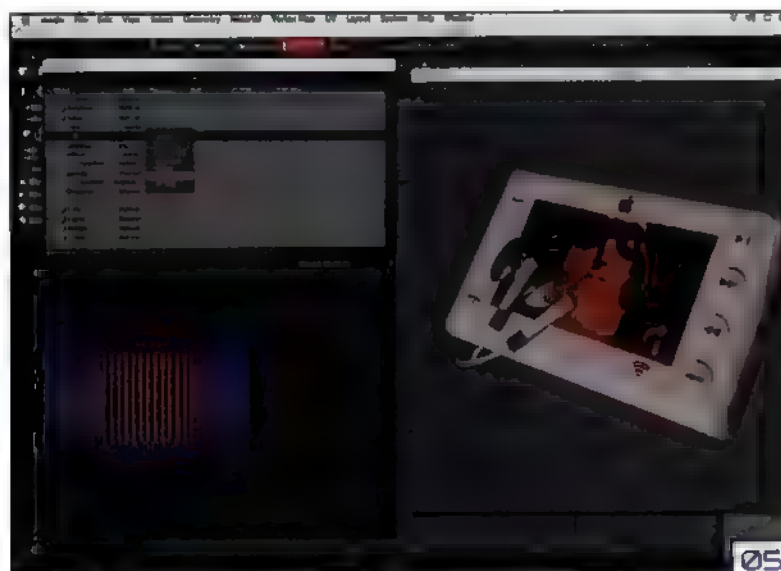
Allied to this is *modo*'s use of the workplane, a virtual grid that enables one to easily constrain movement along selected axes, but which can also be aligned along

the normal of a polygon or group of polygons. This allows you to construct additional geometry on top of an existing model – and then repeat the process by selecting a new poly, hitting the [Home] key and adding some more geometry.

At this point, it's worth mentioning the Tool Pipe, which is a unique feature within *modo*. This panel displays the currently active tools

MODO HAS CLEARLY BEEN CONSTRUCTED AROUND THE CORE PRINCIPLES OF THE MODELLING PROCESS





05

and the mode they're working in. A good example of its use is in the process outlined above: if we were applying a new primitive to numerous mesh faces, you'd have to draw the object after the workplane, and then draw a new object to the same scale. But by right-clicking on the primitive tool label in the Tool Pipe, and selecting Auto-Activate whenever you click the primitive button it'll now create a new object to the same dimensions as before. And, of course, this can also be recorded as a macro, which would let you populate an entire mesh with just a couple of mouse clicks.

REAL-TIME FALLOFFS

The other key aspect of *modo* is its use of Falloffs to attenuate the movement of groups of elements. This isn't anything new, but is implemented in a very user-friendly way. The Falloff guide remains editable until it's no longer needed, with changes applied live letting you move the region of the Falloff and see the effect it has on the mesh in real-time. It's this level of finesse that makes working in *modo* a pleasing and fluid experience.

One of *modo*'s main selling points is the fact that it's easy to customise, in terms of both the user interface and a so-called workflow. The UI is totally modular and every window can be any size and contain any information, be it a view or a menu. So you can either

tweak one of the existing layouts, or create your own, completely from scratch. You can also define your own keyboard shortcuts pop-up menus, colour schemes and so on. The 500-page manual spends over 100 pages just on customising the interface.

So far, so groovy. However, since *modo*'s main focus is Subdivision Surfaces, this debut release currently lacks a lot of the familiar poly-level modelling tools you'll find elsewhere. There are no intelligent polygon reduction tools, should you wish to freeze a poly-heavy mesh, and there's no filleting tool for adding small bevels to mechanical objects. There is also no lath tool, and while *modo* happily opens *Illustrator* lines directly as curves, we had a tough time beveling narrow type cleanly – or at all, in some cases. And while the beveling tools are generally good (they work on vertices, edges and polys), there's no option to plot multiple-step bevels for more complex forms.

While its core toolset might be rightly regarded as basic, *modo* does have a very sophisticated and elegant foundation on which to grow and evolve. And with stiff competition from a number of affordable (or even free) applications, it needs to do this quickly. Fortunately, a modular approach to the application, with its Perl scripting and Tool Pipe construction means that features can be rapidly prototyped and added, either



06



07

[05] *modo* features a basic materials system so you can set colour/diffuse/specular/reflection values and also add texture maps. However, with no automatic sizing option, getting images to fit requires use of scale handles, or the creation of a separate UV map.

[06] The Mesh List in *modo* is similar to *LightWave*'s layering system. This allows you to create objects or parts, name them and then move them in the background. However, its functionality doesn't go much beyond this, and selection is a little clumsy.

as Macros. Scripts are hard-coded into subsequent versions.

Just two months after its release (but too late for inclusion here), Luxology released a fairly significant update, which already answers some of the initial criticisms levelled at the debut release. Included in the 1.02 patch are a number of new tools including Bridge, Loop Slice Selected, Auto-Quad (for making four-point polys from 'tris'), and a Fix Symmetry option. *modo*'s UV toolset has also been extended with the addition of UV Sew, improved UV selection tools and a UV-to-EPS export option.

If Luxology can keep up this pace of development – and retain *modo*'s overall cleanliness and ease of use – then the application has a bright future ahead. ■

VERDICT	
RANGE OF FEATURES	8
VALUE FOR MONEY	7

PROS Interactive Falloff tools >> Quick and easy Subdivision Surface weighting >> Extensive edge and vertex editing >> Action Centre and Tool Pipe

CONS Action Centre workflow takes some getting used to >> Overall stability problems >> Lacks many basic poly-level editing functions

[07] Luxology prides itself on *modo*'s fast OpenGL display (despite initial problems with PC drivers). This mode shows your mesh as a smooth reflective object so you can look for any defects in the construction.

MojoWorld 3

Do you want the world? Pandromeda's fractal-based app can give it to you

BY MAT BROOMFIELD

PC/MAC

PRICE

- >> Standard: £107* (\$195)
 - >> Pro: £258* (\$479)
 - >> Upgrade: £80* (\$148)
- *Currency conversion

MINIMUM SYSTEM

- PC
- >> Windows 98/2000/XP
 - >> 1GHz Pentium III
 - >> 350MB HD

MAC

- >> OS 9
- >> 1GHz Power PC G4
- >> 256MB RAM
- >> 350MB HD

MAIN FEATURES

- >> Fractal planet generator
- >> Infinite detail level and render size
- >> Lots of preset materials, plants, boulders, skies,
- >> Versatile navigator
- >> Step-by-step Layout Mode for beginners
- >> Import terrains from other packages
- >> Import 3D objects
- >> Generate rivers and oceans
- >> Change characteristics locally or planet-wide
- >> Animation (Pro version)
- >> Forests, scattered objects (Pro version)
- >> MojoGraph Pro UI editor (Pro version)
- >> 2D post effects (Pro version)

01 This beautiful icescape shows *Mojo* at its best, and most realistic

02 The new Layout Mode presents new users with a step-by-step workflow, but removes complicated tools so you won't get intimidated by them

DEVELOPER PANDROMEDA

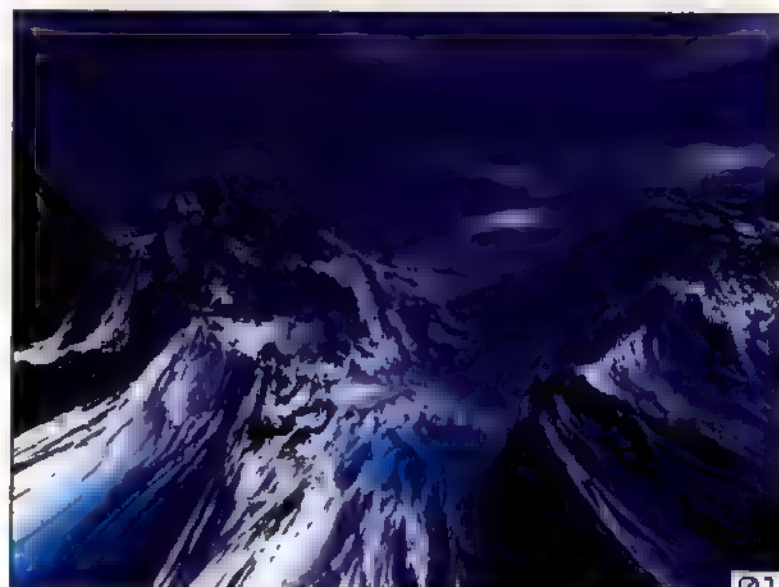
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There are many terrain generators out there, and the one thing that they all share is the fact that they are designed to work on landscapes where the viewpoint is from a few feet to perhaps 20 or 30 miles from the actual terrain. But while the *World Construction Set* can build planets, *MojoWorld* is the only one optimised to work on a global scale, with views as far away as space. Pandromeda waxes lyrical about the animation opportunities that this affords, enabling you to create light paths hundreds or thousands of miles in length. Your camera can approach from deep space and circumnavigate your planet at the height of a few hundred feet, before zooming into individual plants or rocks. It all sounds wonderful, but it's not how most people want to use terrain generators – and if the program's optimised for long-path animation, why is the animation module an extra that doesn't come with the standard version of the program?

SIMPLE PLEASURES

MojoWorld's concept is simple enough: using a series of fractal algorithms you create a planet with infinitely scalable detail. That's the beauty of fractals: the recursive nature of the formulae means that high-resolution geometry-generating detail is produced at whatever distance you are from the terrain. So, with a single set of formulae, an entire planet can be created, around which you can move the camera for an infinite number of views. Unlike rival programs, in *MojoWorld* your terrains have no borders: you can move the camera in any direction until you eventually arrive back at your start point, without needing to manually create additional terrain. But because you can view your terrains from anywhere, selecting a particular view can be time-consuming, so the program offers a randomiser. This favours



01

views that incorporate land, and is a quick way to generate inspiration and different camera positions.

Annoyingly, the slow preview window can sometimes provide only a sketchy and, at times, utterly misleading idea of what the actual rendered landscape will look like, necessitating endless low-quality test renders. When adding complex shaped boulders with the useful new boulder tool, you're simply shown a sphere for positioning purposes. How can you orient complex shapes under these conditions? OK, there's a postage stamp sized preview, but it's too small and far too slow to update to be of real value.

Most real planets don't consist of single terrain types across their entire surface, or at least, not the interesting ones with atmospheres. *MojoWorld* provides the opportunity to create latitude based terrain zones, to simulate ice caps, for example. You can also create a parameter bomb, which is a user-defined square or circular area that can contain localised terrain, trees

a river system, imported terrains from *Bryce*, 3D models and more. If you use a parameter bomb to create localised terrain, the new one will blend seamlessly into the existing terrain. Freehand shaped parameter bombs would have been really useful.

The program doesn't provide a multi-viewport configuration, so you can only add new features in a single view, having said that – and notwithstanding

Mojo's infuriating lack of full navigation controls in the overhead view – in the perspective view, the program has the most responsive and best designed scene navigation

controls of any 3D program we've ever seen.

But *Mojo*'s terrain-editing tools are virtually non-existent, and this is its greatest weakness. You can't manually sculpt a crater or canyon. Instead, you select a formula that generates such objects, then insert them using parameter bombs. Alternately, you can import them from other programs. It seems refreshingly frank, if a little sad, when Pandromeda itself suggests importing specific terrain from other programs.



02



03

Photoshop users may import vectors from *Illustrator*, or video snaps from *Premiere*, but Adobe wouldn't dream of telling you to edit photos elsewhere, then bring them into *Photoshop* for printing. It's a core requirement of the program: just as manual control over localised terrains should be a core value of a terrain generator.

IN YOUR FACE

The interface is not at all intuitive to the first timer. It's infuriatingly obscure, and at times it felt like we needed the services of an Egyptologist to interpret the hieroglyphic-like icons: some were symbols, some were

iconesque graphics, some were buttons that told us we needed the Pro version to use a feature, and some were just really weird-looking buttons and sliders.

Pandromeda kept reminding us that the program's author had worked on *Bryce*, but that's no longer the reference it used to be. Nowadays *Bryce* is last among the terrain generators, and its interface is still a throwback to the days when developers began to experiment with new ways of designing interfaces. Such interfaces were regarded by many in the industry as a



04

failed experiment, and were thankfully consigned to history.

Because it has a lot to do with mathematics, things can quickly get a bit overwhelming. But Pandromeda has tried to simplify things in a number of ways. There are lots of presets, and the Planet Wizard enables you to select general planet attributes: terrain, material, sky, starfield, moon, etc. It'll then make a planet, ready for you to edit.

Another prominent feature that Pandromeda draws attention to is the Layout mode. While it's not a wizard, this Room removes most of the complex tools, provides vast amounts of tool tip help to explain the

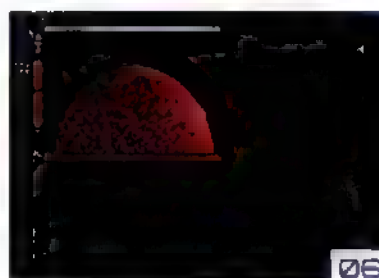
function of each option and, via a sequence of tabbed panels, provides you with a logical workflow through the process of scene creation. It's OK, but it's no substitute for a well-designed

main interface. The whole program should be that well thought out.

MojoWorld is a program that we passionately hated at first. Then we lost our passion and started to see some of its potential. It's undoubtedly competent at creating weird, science-fictiony-looking planets with cooled lava flows, sharp rock



05



06

oscillations, sweeping dunes, towering glaciers, and more. Just take a look at the website to see hundreds of awesome but freaky images. It's not so good at creating Earth-like scenes or creating precise user-defined fine detail.

Once you're past the strange feeling that using this gives you, the sharp learning curve, the initially frustrating user interface, the needless obscurity, the difficulty of creating exact features, and the totally different way of thinking about landscapes, it's quite fun to play with, and the view randomiser gives you that explorer feeling. It has a role in terrain generation, but the whole program needs a bit of a rethink.

Although it sometimes produces great results, and has a few clever tricks up its sleeve, its competitors are much more flexible and effective. ■

03] If the program is optimised for animation, why isn't animation part of the basic package?

04] The best-quality preview doesn't provide a remotely accurate enough idea of the finished render.

05] The planet wizard offers you a simpler way to create the basic parameters for your planet.

06] We zoomed out into space and our verdant planet was transformed into a fireball during the render. This sort of freak-out inexplicably happens sometimes.

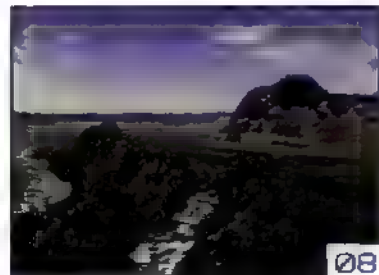
07] *MojoWorld* is one of the best terrain generators that can automatically create overhangs, and cutaways.

08] The Pro version enables you to animate textures, but doesn't offer true water, plant or cloud animation.

IT'S A LITTLE SAD THAT PANDROMEDA ITSELF SUGGESTS IMPORTING SPECIFIC TERRAIN FROM OTHER PROGRAMS



07



08

3D VIEWPORT	
RANGE OF FEATURES	7
VALUE FOR MONEY	7

PROS Infinite views >> Easy to play with once you understand it >> Includes simplifier wizards

CONS Sluggish and infuriating interface >> No undo mode - [Control]-[Z] shuts the program!

RealFlow 3

For realistic running, dripping, bending and breaking, you need some RealFlow **BY STEVE JARRATT**

» MAC/PC

PRICE

- >> Single Command Line version £847* (\$1,200)
- >> Six Command Line versions £1,349* (\$2,500)
- >> Upgrade £270* (\$500)
- * Currency conversion

MINIMUM SYSTEM

PC

- >> Win 2000/XP Pro or Linux 8/9
- >> Pentium II or higher
- >> 512MB RAM
- >> 30MB HD

MAC

- >> OS X 10.3.5
- >> 1GHz G4 or higher
- >> 512MB or higher
- >> 50MB HD
- >> Unix X11 subsystem

MAIN FEATURES

- >> Fluid dynamics simulator and improved fluid engine solver
- >> Supports Metaball-based polymesh export
- >> Command Line version for additional CPUs
- >> Solid-body dynamics and elasticity
- >> UV texture mapping for 'wetting' effects
- >> Built-in help system
- >> Includes splashes, wave propagation and buoyancy
- >> Connects with all major 3D apps via free plug-ins

[01] RealFlow's ability to export meshes with morph targets creates inter-frame motion blur. This feature is unique to LightWave simulations

[02] New to RealFlow 3 is its elastic modelling. This rubbery object is stretched up to, and then beyond, breaking point - it'll actually snap in a realistic fashion

DEVELOPER NEXT LIMIT

WEB WWW.NEXTLIMIT.COM

CONTACT SALES@NEXTLIMIT.COM

Many off-the-shelf 3D apps now feature integrated particle systems, but few are capable of reproducing the real-world fluid simulations that Next Limit's *RealFlow* reveals in. This standalone package has just been given a major overhaul with a new fluid engine solver, rigid body dynamics, elastics, a Command Line option and cross-platform compatibility, with an identical interface on Windows, Mac OS and Linux.

Set-up is relatively straightforward although, for most projects, objects are constructed and animated in other apps and exported as proprietary .sd files. Once in *RealFlow*, any objects requiring dynamics are equipped with the necessary constraints (hinges, springs, rope etc) and the requisite particle emitters added. These can take the form of circles, squares, objects or even texture maps. Effectors, known as 'daemons' - are then attached to the various nodes to apply forces such as gravity wind and so on. It's then just a case of setting up the export options to save dynamics data, particle or mesh sequences and any object deformations, and hitting the Action button to begin the solution.

We tested the new Mac OS version which runs under the Unix X11 windowing system. In true Apple style, this requires little more than a download and install but *RealFlow* then runs just like any other native app. The interface is new, but it's not significantly different from previous versions.



01

Most options are accessed via drop-down panels on the far right, and the biggest problem here is that the icons for daemons, emitters, meshes and options are all confusingly similar; using names would've been less stylish, but worked far better.

While the simulation is running, the OpenGL display remains very responsive (some might say over responsive), even with tens of thousands of particles on screen. However, during set-up, object selection and

manipulation is a little fiddly, requiring exact selection of the XYZ handles. Fortunately the numeric keypad provides Hotkeys to change the display style and viewpoint.

Simulation speed is good compared to other particle systems, although it doesn't seem to be appreciably faster than previous versions - even with simple scenes. And despite *RealFlow*'s multi-threading, the Mac release doesn't make full use of our dual-processor configuration. During simulations, there was at least another 25-50% performance to be wrung from the system, so we're hoping for further optimisations.

Traditionally, recreating fluid systems falls mainly to particles and an accompanying volumetrics system, which can be ill behaved and painfully slow. Part of *RealFlow*'s genius is its ability to generate Metaball-style polygonal meshes which are then imported in sequence, back into your main app. The two mesh sequences for *LightWave* also retain velocity information as morph targets, so you can reproduce motion blurring and rendering solid geometry is faster than volumetrics by an order of magnitude. Fortunately because polymeshes are based on particles, you can create the meshes at any stage during the project.

RealFlow incorporates a large chunk of Next Limit's *RealWave* application for fluid



02

surface meshes, with buoyancy and wave propagation. And this latest release also features the addition of 'wet maps' whereby an object's UV map is textured according to where it comes into contact with a fluid.

Of course, it's easy to forget that *RealFlow* is basically a particle generator, so it's just as capable of reproducing explosions, smoke, welding torches or nebulae – and several of the daemons' – Noise, Vortex, Conolis, Ellipsoid Magic – are designed for just such a function. Luckily, it also has daemons for removing particles based on age, location or isolation (ie. particles without neighbours) which can be used for constraining movement, tidying up a scene or simply managing the particle count.

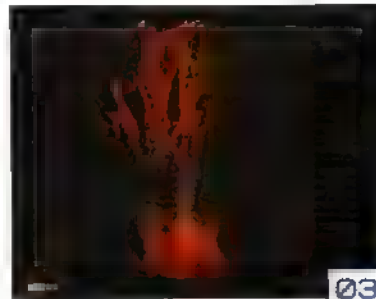
Setting up and watching simulations being solved is fascinating – and rather enjoyable. Sadly, getting all this information back into your 3D app isn't. *RealFlow* has opted for a plug-in bridge between programs and though something of a chore, they should, in theory, work fine once you understand *RealFlow*'s export system.

CRASH TEST DUMMY

In practice, we had varying success with both *LightWave* and *Cinema 4D*. Meshes generally import OK, but most of our attempts at altering the surface texture in *LightWave*, and then saving out the mesh, resulted in either a fatal crash or object replacement (a generator on. Worse still, we had zero success in importing any dynamics sd files – we could create flowing liquids, but objects still remained resolutely static (a problem seemingly limited to the Mac release). Admittedly, importing mesh sequences and dynamic data isn't a trivial matter, but given that *RealFlow* has no rendering output, it's incumbent upon next limit to solve these issues, and do so quickly.

Other problems include some rather hit-and-miss keyframing, interface problems with the Curve Editor and annoying fatal crashes when trying to get objects to interact with a *RealWave* particle field. We definitely recommend that you download the 30-day demo and plug-ins, and test it with your own set up before purchasing.

With its host of new features and cross-platform compatibility, *RealFlow 3*



03

sets a pretty high benchmark for fluid dynamics on the desktop (although there's some fresh competition from Frantic Films Software's upcoming *Flood*). Simulations are accurate and the amount of control you have

to finesse the shot is more than adequate.

It's hard to ignore the overall stability of this release, even though it's essentially a v1.0

on the Mac, we suffered far too many crashes and struggled for too long with errant plug-ins to make this a satisfactory experience. Also, the increasing prevalence of solid-body dynamics and particle systems available for the major 3D applications does



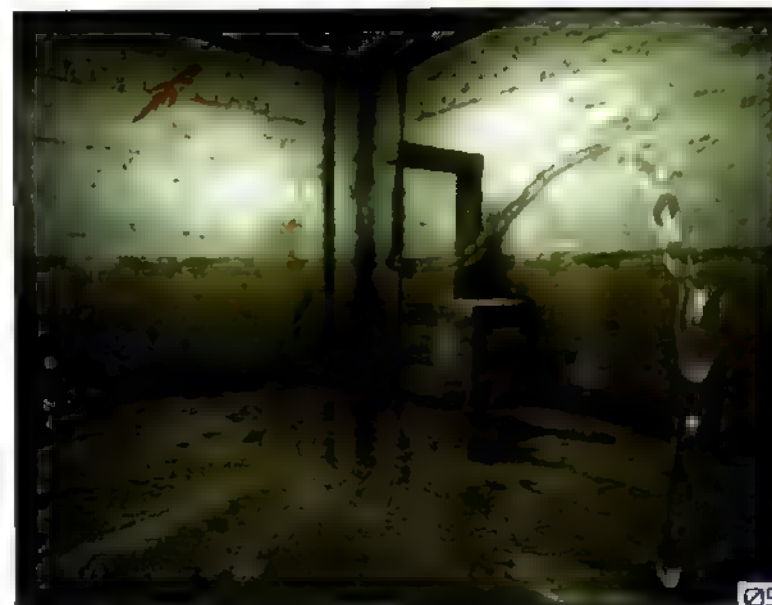
04

make you ponder the price tag. We can only hope that the remaining bugs are quashed for the next release, because *RealFlow 3* is an application dripping with potential. ■

VERDICT	
RANGE OF FEATURES	9
VALUE FOR MONEY	6

PROS Fluid and rigid-body dynamic solver >> Can avoid using volumetrics with mesh export >> Command Line versions for multiple simulations

CONS Relatively expensive >> Serious stability issues >> Plug-ins are flaky >> Some UI niggles



05

[03] By employing various 'daemons' or effectors, *RealFlow* can simulate explosions, tornadoes, fires and so on.

[04] A basic *LightWave* object collides with a *RealWave* mesh. The ball deforms the waves while a *Splash* daemon ejects particles wherever the ball surface comes into contact with the mesh.

[05] In *RealFlow*'s new 'wet mapping' feature, greyscale UV textures are shaded according to their contact with particles. This information can then be used to alter reflection, specular and diffuse values, all adding to the wet effect.

Alienware MJ-12

For those who want portability, but aren't prepared to compromise on power **BY MAT BROOMFIELD**

DEVELOPER ALIENWARE

WEB WWW.ALIENWARE.CO.UK

CONTACT +44 800 279 9751

PRICE

>> £1,814 (\$3,982*)
*Currency conversion

MAIN FEATURES

- >> Windows XP Pro SP2
- >> Pentium 3.4HT
- >> 2GB RAM
- >> 7200RPM 60GB hard drive
- >> Nvidia FX Go1000
- >> 1GB Ethernet
- >> 16x DVD writer
- >> 15.4" LCD screen
- >> Mini wireless mouse
- >> 3 x USB 2
- >> FireWire
- >> Wireless LAN
- >> TV out
- >> Kensington lock point
- >> Programmable Synaptics Touchpad
- >> Built-in microphone
- >> Smart Bay drive with dual HDD Support
- >> 3-in-1 Media Card reader
- >> Dual Infrared ports with remote control
- >> Dimensions (W) 35.05cm x (D) 28.95cm x (H) 4.08cm

Alienware has made a name for itself by targeting wealthy gamers with high-performance systems. However, the very things that players of demanding first person games such as *Doom* and *Half Life 2* require – lots of processing power, a decent 3D accelerator and a ton of memory – also happen to be very important to 3D users too. With that in mind, it's not all that surprising to see that the company also caters to the low-end workstation market too. But there's nothing low-end about this laptop.

Like most manufacturers nowadays, Alienware builds each and every machine to its customers' individual specifications: any advertised models are simply a starting point. Bear in mind that, for this review, Alienware sent us what they consider to be an attention-grabbing system, but yours could be better or worse, specified according to your needs.

It's rare that you'll get such a tremendous sense of feel-good from a product; you'll be impressed from the second you open the box, and see how professionally this package is assembled. Extensive manuals, good packaging, and the laptop itself – it's simply breathtaking to look at, and its appearance is equalled by its tactility.

After turning it on, you're greeted with a glacier-clean desktop – it was refreshing to see the lack of millions of programs and icons cluttering it up, and none of that annoying default software installed on the hard drive (if we want *Office*, or anti virus, or video

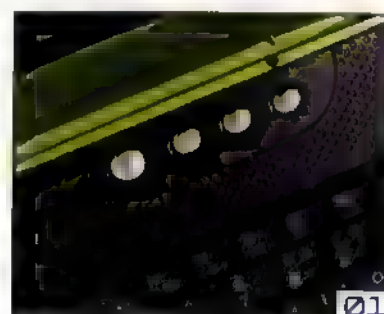
capture software, or any of the million other things most manufacturers supply, we'll buy the ones we want, OK?)

The machine itself is a rather strange beast: it has 2GB of RAM and a massive HyperThreading 3.4GHz Pentium 4 processor in it – not a P4M or any other type of mobile processor. Although a lot of us have never encountered such a thing before, you'd expect it to present two major problems: cooling, and power consumption.

HOT SLOTS

The system definitely runs hot, but a combination of active cooling using fans, and passive cooling via its titanium case (which dissipates the heat) keeps it all comfortable. As for power consumption, there's no way around it – if you want desktop performance, you're not going to be able to operate on batteries for long. If you somehow manage an hour with the MJ-12, you'll be doing extremely well, so despite its gorgeous livery, this is not a laptop to pose with on long train journeys. It is, however, a great machine to whip out with an understated flourish at your clients' premises to demonstrate how successful you are!

In addition to the CPU, the system comes with a 128MB Nvidia Go1000 mobile graphics chip. This provides excellent image quality and adequate entry-level 3D performance. That performance is delivered via a 15.4 inch screen running at a weird 1680x1050 resolution, providing a wide aspect ratio almost equivalent to a widescreen TV. One of the things that distinguishes Alienware screens is their relatively fast



25ms (milliseconds) response times, which makes them ideal for animation. Although standalone LCD monitors are now in the range of just 12-15ms, this is still good for a laptop. Slower screens can't redraw the image quick enough to keep up with fast movement.

The package is nicely rounded off with three USB 2 ports, FireWire, 1GB Ethernet and a wireless network. All in all, a highly desirable and functional laptop.

3D	MARKET	
RANGE OF FEATURES		8
VALUE FOR MONEY		8

PROS Blisteringly fast >> Stylish and professional looking >> Clean desktop >> Extensive manuals >> Good screen resolution

CONS A lot of money >> Short battery life so not good for desktop use >> Small hard drive

Benchmarks

If you're tempted by the MJ-12's stylish looks and think the fact the alien badge lights up is 'really cool actually', here's how the Nvidia Go1000 stacks up against professional desktop GPUs.

TEST	MJ-12	FireGL X2-256T	FX1100
3dsmax-02	20.50	22.83	27.05
drv-09	97.18	128.5	121.69
dx-08	106.7	137.2	138.06
light-06	22.79	27.63	31.56
proe-02	27.26	33.66	37.82
ugs-03	26.71	41.89	36.58

CPU/FPU tests

Check the MJ-12's raw number-crunching power compared to a desktop Pentium 4.

MJ-12	P4 3.20Hz
Sandra MIPS	Sandra MIPS
10174	9124
(Higher scores better)	(Higher scores better)
Sandra MFLOPS	Sandra MFLOPS
4249/7199	3742/6554
(Higher scores better)	(Higher scores better)

[21] Desktop performance means battery power is not the MJ-12's strongest suit; an hour is about your lot.

[22] Three USB 2 ports, a FireWire, 1GB Ethernet and a wireless network await those wishing to commune with the alien.

[23] It lights up. Awesome...

#085



02



03



THE MJ-12 IS A GREAT MACHINE TO WHIP OUT WITH AN UNDERSTATED FLOURISH AT YOUR CLIENTS' PREMISES, TO DEMONSTRATE JUST HOW SUCCESSFUL YOU ARE

StoryViz

Storyboards are no longer confined to stills. Now they walk and talk!

BY CHRISTOPHER MULLINS

PC

DEVELOPER REALVIZ

WEB WWW.REALVIZ.COM

CONTACT INFO@REALVIZ.COM

PRICE

>> £1,955* (\$3,600)
(excluding VAT)
*Currency conversion

MINIMUM SYSTEM

>> Windows 2000, XP
>> Pentium III 500 MHz
>> 256MB RAM
>> 200MB HD
>> Any Windows
compatible video card
(NVIDIA, GeForce 2
or ATI)

MAIN FEATURES

>> Real-time 3D graphics
engine with lighting,
shadows and effects
>> Non-linear editing
>> Sound synchronisation
>> Export html pages for
still-shot scenes
and text
>> Export to video
with timecode
>> File conversion plug-in
for Maya that preserves
geometry, animation
and texturing

01 Import your own
characters, textures
and animations for
true pre-visualisation

02 StoryViz's default
library of characters
can be easily posed
and animated by
manipulating each joint

03 Export your final
scenes into a movie file
complete with frame
counter, camera type
and timecode

StoryViz is the latest release from REALVIZ, whose other applications include *Stitcher*, *MatchMover*, and *ImageModeler*. StoryViz enhances the storyboarding process and provides enough tools and flexibility to create a more advanced animatic – complete with animation, textures, lighting, and effects – for better all-round pre-visualisation.

Unlike similar applications, such as *FrameForge 3D Studio*, StoryViz comes complete with a plug-in for Maya that allows the user to export all models, textures and (most importantly) animations into a custom format and bring them into StoryViz to create a scene. This import/export feature gives StoryViz a huge advantage over its competition as it'll satisfy those filmmakers who want their animatics to reflect the original look and theme of their own film.

You won't be forced, for example, to use a library of police officers and business men to represent the characters in a story about robots. But you don't have to import your own models and animations. StoryViz has its own set of standard characters and props, as well as an editor for the characters, all of which can be keyframed. You can create as many scenes as desired, then run a Batch render to string them all together into a movie with or without sounds, timecode included.

TELLIN' STORIES

StoryViz is set up much like a standard 3D application and requires that the user have a basic understanding of interacting with objects in a 3D environment. For example, in *FrameForge 3D Studio*, objects can very easily be dragged and dropped into the scene, but they are all confined to a grid and clipping restrictions prevent objects from overlapping in any way. StoryViz allows more freedom and doesn't seem to have any of



these restrictions. This can be a blessing for those who wish to create a more customised scene, but a hindrance to those who just want to assemble a scene quickly, without a lot of hassle. Maya

users will be familiar with the tools for manipulating and keyframing cameras, lights, characters and objects, but filmmakers who aren't accustomed to 3D software may have a hard time using StoryViz to their advantage.

Due to its unique ability to handle animations, the interface includes a timeline that's set up much like the one found in *After Effects*. This lists all of the scene's objects, so you can click on the name of a

specific object and edit its keyframes individually without having to locate the object within the scene.

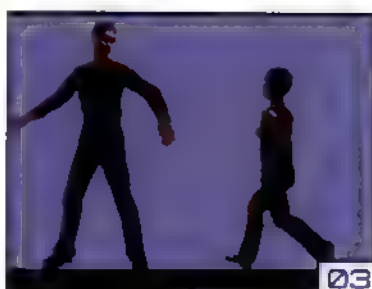
Even though there are some similarities to

Maya and other 3D applications the interface is a bit more intuitive.

Most of us usually expect the first version of a software

application to be somewhat experimental but in future versions, I would expect close attention to be paid to the layout of StoryViz, and its user-friendliness. Also, if you compare this \$3,600 product to a brand new version of *Maya Complete*, which lists for \$1,999 for example, and you might conclude that, in its first incarnation at least, the program is quite overpriced for what it offers. ■

STORYVIZ ALLOWS MORE FREEDOM THAN OTHER APPLICATIONS



VERDICT	
RANGE OF FEATURES	9
VALUE FOR MONEY	6
PROS Animation and effects >> User isn't restricted to a specific library of models	
CONS Aimed at a more advanced user >> Far too expensive for what it offers	

CG Academy – AfterBurn Masters

Master explosive FX with this feature-packed set – just keep your finger on pause **BY PETE DRAPER**

DEVELOPER CG ACADEMY

WWW.CG-ACADEMY.NET

INFO@CG.ACADEMY.NET

One of CG Academy's first main releases is this full *AfterBurn* set. Hosted by particle guru Allan McKay, it's expertly presented, and covers the full range of *AfterBurn* features.

The tutorials are displayed in the standard Combustion player, and are fired off via each DVD's UI. Users on notebooks (or those with smaller resolutions) may have trouble viewing the entire screen though, as it can't be resized – the AVIs can be played and resized in

Windows Media Player. No one can dispute McKay's knowledge on the subject matter: the 90% explosion-oriented effects look fantastic, but it would have been useful for users if he had covered effects that other tutorials don't – such as tornadoes, hurricane systems or avalanches (although additional effects such as clouds, nebulae and hypersolids are covered in the first DVD).

The content on the first couple of DVDs is fast-paced, and users will have to use the pause button frequently to follow the speed at which McKay works. By the third one, though, the speed relents and it settles down to become a well-tailored product.

You do have to amend the settings several times throughout some of the 'fundamentals' tutorials (on the first DVD), as viewers are encouraged to 'play with the settings'.

AfterBurn Masters, CG Academy's first release, is a good start to a series that is set to become a cheaper equivalent to Maya's *Onion*.

This method is a lot cleaner by the third DVD – *Air Strike* – but it could be a bit more focused in the initial stages.

Although it comes in a slickly packaged box set, you can also buy each DVD individually. If you're into *AfterBurn*, and think you know your stuff, this is the most detailed and advanced set out there, and definitely worth a look. ■

3D VERDICT	
RANGE OF FEATURES	8
VALUE FOR MONEY	8

PROS Comprehensive cover of all *AfterBurn* features >> Tutored by a renowned industry professional >> Effective results on all tutorials

CONS Early content is fast-paced and difficult to follow at times >> Player screen can't be resized >> For advanced users only

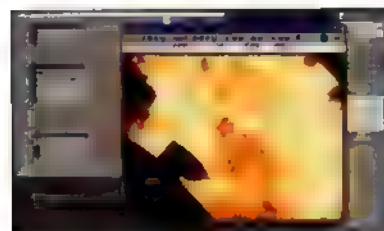
PRICE

>> 3 DVD set: £110 (\$197)
>> Individually: £44 (\$79)
(excluding VAT)

>> Any system capable of running 3ds max 6

FEATURE LIST

>> Basic Theory of *AfterBurn* plug-in
>> *AfterBurn* UI & Features
>> Multiple tutorials illustrating tips & tricks
>> Compositing effects to intensity (combustion)
>> PFlow scripting
>> Full assets included on each DVD



XSI – Advanced Character Rigging

This tutorial will realise every wannabes' dream – or is it too good to be true? **BY OLA MADSEN**

DEVELOPER 3D TUTORIAL

WWW.3DTUTORIAL.COM

OFFICE@3DTUTORIAL.COM

This training series starts off with the 'fundamentals' volume, and takes you from start to finish in the ground rules. As the name implies, it targets newcomers to character animation but even intermediate users will find valuable tips. In the second volume you're guided through rebuilding the rig from scratch,

adding advanced control for things like the foot roll. The third volume deals with enveloping and weighting your character and various approaches to facial animation. The series is completed by the fourth volume: a seven-and-a-half-hour explanation of the issues you'll face when dealing with secondary animation.

Other training materials limit their shown solutions by singling out a specific technique, but the ACR series stands out from the crowd. The methods are carefully demonstrated and the advantages, and possible drawbacks, of each technique are openly discussed.

With the entire series adding up to almost 30 hours of video it's easy to lose track of which ones you've watched, and which are next; it would be helpful if each video was

somehow visibly marked. Despite being recorded using *SoftimageXSI* 3.5, and while some important features were introduced in *XSI* 4, the tutorials are still up-to-date.

This mammoth collection will teach you all you need to know about advanced character rigging. While listening to the same voice for 27 hours is enough for some, this is a pleasant and useful training experience. ■

3D VERDICT	
RANGE OF FEATURES	10
VALUE FOR MONEY	9

PROS An exhaustive and educational approach to character rigging >> Different solutions are carefully shown and explained >> Videos are of high quality

CONS Confusion over which videos you've seen >> Created using *XSI* 3.5

PRICE

>> £28* (\$49.99) per volume
*Currency conversion

FORMAT

>> Download and CD

TOPICS COVERED

>> Basic and advanced rigs
>> Muscles
>> Scripting, Cloth animation, interacting with other objects
>> Synoptic View

EXTRA FEATURES

>> Complete project files are included

DURATION

>> 26+ hours



The *Advanced Character Rigging and Character Setup* training set stands out with its focused demonstrations and discussions



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PEOPLE POWER

Hollywood design and production studio yU + co has hired **CLAIRE O'BRIEN** as Executive Producer of its Feature Film Creative Services division. O'Brien has previously worked at New Line Cinema and Disney, overseeing post-production work on films for the two studios. Her most recent credits include working as Post-Production Supervisor on *Collateral* and *The Butterfly Effect*. For yU + co, O'Brien will oversee film projects, including main title and film design sequences. www.yuco.com

PHILLIP MILLER has been appointed Executive Vice President of Business Development at mental images U.S. subsidiary, mental images Inc. Miller joins the rendering experts with a track record of promoting leading software solutions at Autodesk, Discreet, and Instant Effects, in addition to architectural design. www.mentalimages.com

Suspect, a New York-based visual effects and design studio has recruited Visual Effects Artist **SUSANNE SCHARPING** to its staff. Scharping joins from Bloomberg, where she spent five years as a flame artist, freelancing on a variety of projects for well-known clients. In 2004, her work earned her several Promax and BDA Awards including a Promax Gold, a BDA Silver and a Bronze. Scharping, Suspect has also announced the addition of another flame system to its studio's capabilities. www.suspect.tv

HOW DID YOU GET YOUR JOB?



MATT SILVERMAN

Visual Effects Supervisor
and Design
at The Mill
www.phoenixstudio.com

HOW WOULD YOU DESCRIBE WHAT THE JOB INVOLVES?
Create and direct visual effects and motion graphics for TV spots.

HOW WOULD A TYPICAL DAY UNFOLD?

There isn't really a 'typical' day. Some days I'm compositing effects shots in flame. Other days I'm designing end tags in After Effects. The only day I want to be modelling in Maya. And then there's off-site work supervising shoots and working with clients. This is what keeps me going - every day there's a new challenge, and it never gets boring.

HOW WOULD YOU DESCRIBE WHERE YOU DON'T WANT TO BE?

Freelancing on various projects around Silicon Valley for clients including Apple, Google, and others. I have spent six months working at Puffin Designs, managing John Knell's software (*Love Flare Pro*, *CyberMask*, *Mixing Link*) while he was supervising *Star Wars: Episode 1*. This gave me a chance to travel around the world to meet with post houses to show them John's tools as well as Comanche.

HOW WOULD YOU DESCRIBE YOUR EXPERIENCE GETTING THERE?

I came in as a freelancer to work on a series of TV spots for Yahoo. After three months, Phoenix and I hit it off, and I've been there ever since. When I started, they were primarily focused on creative editorial, so thankfully I already had more skills than they were expecting.

HOW MUCH PACE OF SERVICE WOULD YOU HAVE TO AVOID TO BE AN ARTIST HOPING TO BREAK INTO THE INDUSTRY?

If you want to get into this business you really need to love it. If you don't have a passion for it, find something else to do. As Marx said, it's all about the passion.

WHERE DO YOU HOPE TO BE IN FIVE YEARS' TIME?

Basically right where I am today. I'm very satisfied with my current situation. The main difference will be a bigger team and a broader client base... Oh - and a much faster Mac!

COMPANY NEWS

Oxford based developer **NATURALMOTION** has announced that London VFX production company The Mill has purchased *endorphin*, its AI and dynamics-based character animation system. Jordi Bares, VFX Supervisor at The Mill, said: "NaturalMotion's *endorphin* is a higher level animation tool that can take over and run a simulation in a directable and intelligent way, something that is key to everybody in this industry, and which, in my humble opinion, is the future of 3D animation. With early stages, we know *endorphin* will play a significant role in our animation tools, and because it is extremely fast and easy to use, believe adoption will be fast." www.naturalmotion.com

Animator Cleber Redondo has launched **WIMZE STUDIOS**, a full-service animation house based in Fairview, New Jersey. Wimze will provide 3D character animation for TV, games, and other markets, and is currently producing the pilot for *The Freckleheads*, a 26-episode animated children's series. www.wimze.com

Quiet Man, a New York-based visual effects studio, has launched a sister studio called **GRASSHOPPER**. The studio will specialise in design, visual effects and compositing. The brainchild of Quiet Man co-founders Johnnie Semerad and Amy Taylor, Grasshopper will be helmed by Creative Director/Director Mindy Dubin. www.grasshoppermy.com



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Finally a really basic 3ds max textbook

Spline modeling
Box modeling
NURBS
Texturing
Lighting



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Full color
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Written for beginners and for teachers

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EXHIBITION

EXHIBIT YOUR CREATIONS

If you're an up-and-coming 3D artist, our Exhibition section is the place to showcase your work. Each issue, we present the best 3D artwork and animation stills that have been produced outside of the major design houses.

Please note that contributors will be granted a non-exclusive worldwide licence to publish, both in printed and electronic form, by 3D World.

We also regret that we cannot reply to every letter or email we receive in person. Selecting and assembling the images does take time, so if your work has not yet been published, please be patient.

SUBMISSION GUIDELINES

Ideally, images should be rendered out at least 3,000 pixels wide or high. Images under 500 pixels in size will not be used in the magazine. Nor can we print smaller images that have been realized in Photoshop. Always include a text (.txt) file with your images containing the following things:

- Your name
- Your email address
- The URL of your website
- The title of each image
- How the image was created
- The software you used to create it
- A little bit about yourself

Don't feel obliged to write pages:

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Files under 3MB in size can be emailed to: 3dworld@compuserve.com

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SHOWREELS

Send your showreel or short animation to the address above, and you could see it on

TV. Showreels should be submitted in QuickTime, MPEG, AVI or DivX format on CD, DVD, or Zip disk. No material with a copyright soundtrack can be included. Try to keep files under 30MB.



#093



**KHALID ABDULLA
AL-MUHARRAQI**

a HUNTING TOY

b CURIOUS-3

c ARABIAN WARRIOR HORSE

USING: *LightWave 8, BodyPaint 3D,
Photoshop*

"Art has always been my passion, something I inherited from my father, Abdulla Al-Muharraqi, who is an internationally renowned artist and a household name in Bahrain. I sold my first illustration, an oil painting, aged 11, for \$2,000. Recently, following a formal education in art and interior design in the US, I have developed a strong interest in animation. At first I didn't like the idea of using technology in my art but it only took me six months to get over my prejudice.

I'm the only Arab artist listed on Lightwave 3D developer NewTek's website, which includes an interview with me and examples of my work."

[e]: khalid@muharraqi-studios.com
[w]: www.muharraqi-studios.com



EXHIBITION

CHARLI SIEBERT
MY LITTLE FANONIST

USING: Poser 4, Photoshop 7

"I'm a 22-year-old digital artist from Huntington Beach, CA. All of my work is created digitally using programs like Photoshop and Poser, in which I'm completely self-taught. I was involved in a group exhibition at Echo Gallery in Chicago last December, and my work is going to be featured in upcoming issues of *Fleshrot* magazine, *Dark Moon Rising* and *Pixel* magazine. My work is currently featured in the Spooky Art Show at The Art Café in Davison, MI. I have many online galleries at sites such as www.renderosity.com, www.deviantart.com, www.epilogue.net, www.spookyart.net, and 3dartists.com. I get much inspiration from artists such as Brem, David Ho, Luis Royo, Brian Froud, and Ray Caesar."

[e]: tee82@hotmail.com

[w]: <http://phane82.deviantart.com/gallery>



#095



KURT BOUTILIER
CYBER-FROG

USING: *Maya, Photoshop*

"I'm a 3D artist currently living in Edmonton, Alberta, Canada but was born and raised in Niagara Falls, Ontario. I began drawing and sketching at a very young age. After high school, I obtained a Diploma in Graphic Design, then went on to earn my Bachelor of Fine Art. I did some freelance work for a while but felt the 3D field would offer more freedom to express myself.

I work for [simplifymaya.com](http://www.simplifymaya.com), which is based in the UK. I produce downloadable video tutorials as well as some DVDs which are both available from the site. I really enjoyed creating the Cyber-Frog because it was one of those projects that turned out exactly as I'd envisioned it; from the initial concept sketch right through to the final render. The biggest technical challenge was texturing and lighting him to fit into the environment in a believable way."

[e]: kurt3d@go.com



ROBERT RAPSON
UI-OH

USING: *3ds max 5, Photoshop 8*

"I'm a 23-year-old student from Plymouth, and the image is from an animation I did last year. I really enjoyed making the facial expressions for the alien and I'm trying to take this further in the next animation I'm working on, which is about a superhero badger and his arch nemesis, a wheelchair-bound rabbit. The alien was box modelled, and the head and the rock were textured using noise maps. The background was rendered separately and blurred in Photoshop to achieve a quick depth-of-field effect."

[e]: sureboras_red@yahoo.com

EXHIBITION

RAVINDER SEMBI ENCLOSED SNOWMOBILE

USING: 3ds max 6, V-Ray,
BodyPaint 3D, Photoshop 7

"The design of the snowmobile craft is by Scott Robertson. I took his rough sketch and finalised the design in 3D. It took about a week to model the craft, a day to model the pilot, and another week to make sure the environment looked just right."

[e]: Ravindersembi@gmail.com

CHRISTOPHE COURGEAU LOUVRE BY NIGHT 1022

USING: Maya, Photoshop

"I'm a matte painter, living in France and working for [post house] Mikros Image. I always loved old images of Paris, so when I started to learn Maya, I knew it was going to be the perfect tool to recreate places that don't exist any more. The process was quite hard because I don't yet know the software by heart, so I used only very simple tools to build each building, then painted them in Photoshop. I'd like to do more in the future, maybe recreating the whole city – but those kind of scenes are so heavy that it's not going to happen in the near future."

[e]: tohook@wanadoo.fr



#097



03 PETE SUSSI
MOLE WARRIOR

USING: *LightWave, Photoshop*

"I'm a Creative Director on Long Island, NY and have been doing freelance work on the side for four years. 3D is a real passion for me.

This image was based on a wonderful piece of concept art by Feng Zhu. I wanted to see how close I could come to an existing piece of art, and not modifying the concept to make it easier to model. I used *LightWave* to create the model, using *SubPatches* and *splines*. The images were done in *Photoshop*. The high-res render was done using the great *Worley* plug-in, *FPrime*. I love the out of the box render of *LightWave*, but using *radiosity* on a large file is a real burden on my computer - *FPrime* rips through the render and gives a fairly similar results."

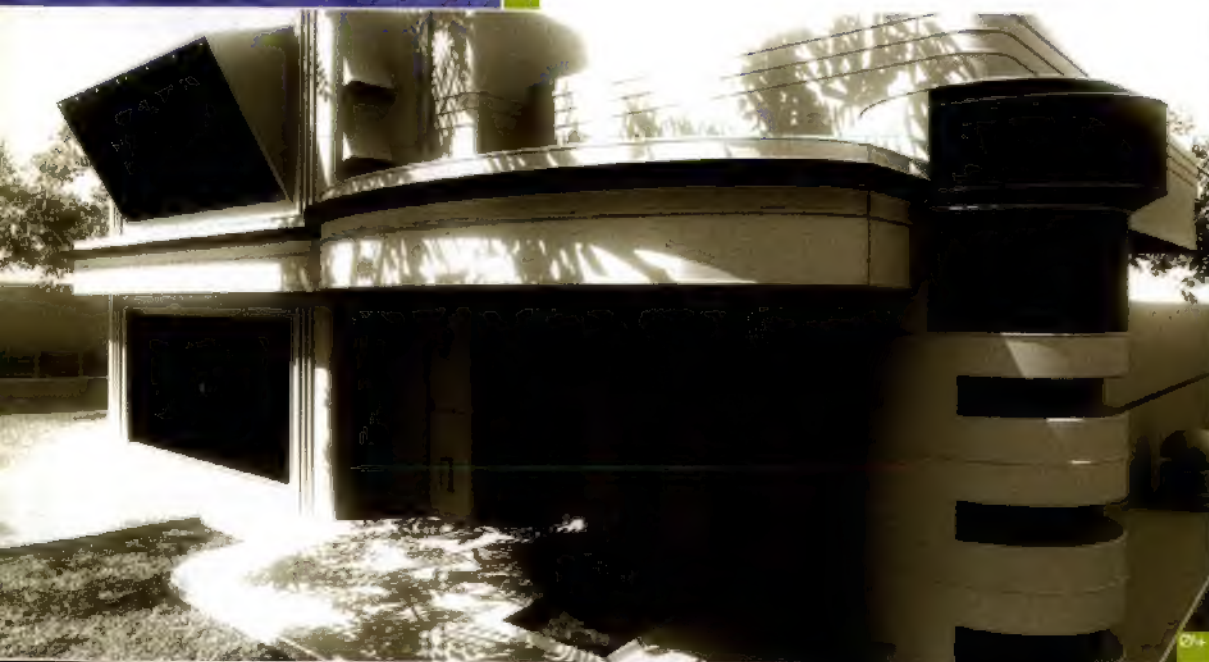
[e]: psussi@optonline.net
[w]: www.sussidesign.com

04 JOMAR MACHADO
DISCOVERY

USING: *3ds max, Photoshop*

"I'd worked at McCann Erickson and JW Thompson for many years. I was a traditional illustrator working with ink and pen, and in 1994 I went to the Computer Graphics department. At the weekends, I used to play with *Bryce* at home. When I left Thompson I was invited to open an Digital Studio to work with other artists. Now, I'm working with a great photography studio, StudioH. There, I create previsualisations of objects, and objects that are too difficult to make a mock up of. Sometimes I create all the scenery for a photo in 3D. The software I use is *3ds max* and *Photoshop*. I always render with *mental ray*, using *Global Illumination* and *Final Gather* or *HDRI*."

[e]: jomarmachado@hotmail.com
[w]: www.studioh.com.br



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“BACK CHAT”

Andrew Daffy

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CGI Supervisor Andrew Daffy has recently set up The House of Curves, which will act as both a studio and a school. He's currently working on a CGI version of the bear from UK TV series *Bo' Selecta!* for a Christmas special. His new website will go live in January.

WHAT TIME IS IT RIGHT NOW, AND WHAT SHOULD YOU BE DOING?
It's 3am and I'm working. And considering my deadline, I really should be working!

WHEN YOU'RE OFF DEADLINE, YOU'LL BE BUSY DOING WHAT?
Doing what I should be doing at 3am – sleeping. It's such a glamorous life in 3D.

MOST POPULAR CD IN THE STUDIO...
Layo & Bushwacka – *Night Works*. As the title suggests, it gets you through the early hours.

WHERE DO YOU GO FOR LUNCH?
I'm making a concerted effort to lose the eight-year-old belly I grew during my time at Framstore CFC, so I prepare my own food (if you class a couple of carrot sticks and some boiled 'quinoa' as food).

BEST MOMENT OF YOUR CAREER...
The first film I worked on was *Fairytale*. I took my Mum and Grandma to see it in a cinema full of noisy four-year-olds. My shot was first up and when it came on, the kids started pointing at the screen and you could hear whispers of "look Mum – fairies!" all over the auditorium. It was really quite special (sniff).

AND THE MOST HUMILIATING...
Having to walk with a broomstick under each arm, pretending to be a Pterosaur walking on land, surrounded by my colleagues and a BBC film crew for the 'Making Of' section in *Walking with Dinosaurs*.

YOUR STUDIO COULD REALLY DO WITH...
An office that's not in my bedroom.

WHAT CAN YOU SEE FROM YOUR STUDIO WINDOW?
The delightful daily criminal occurrences of Graham Road in Hackney.

WHAT'S THE BEST 3D THING NEVER INVENTED?
A controller where the pointer on the screen is driven by where your eyes are looking, and blinks count as mouse clicks. The RSI problem is fixed, and the sign on the wall saying: "You don't have to be mad to work here..." would be much more appropriate.

WHO WOULD YOU MOST LIKE TO GO DRINKING WITH?
George Lucas, so I can ask him what went wrong...

WHICH ANIMATED CHARACTER DO YOU RELATE TO MOST?
The dog who barks at loud passing trains in *Les Triplettes de Belleville*. As a stress reliever I love screaming at the top of my voice in noisy, anonymous situations – like while driving on motorways. Oh... time for my pills.

IF YOU COULD HAVE ANY SUPERPOWER, WHAT WOULD IT BE?
I would be Dr SwapSpace, and plug myself into the machine when the ten hungry programs I have running are all in need of urgent attention.

WHO OR WHAT IS YOUR BIGGEST INSPIRATION IN 3D?
Right now it's the European film schools, and the work they produce. I'm constantly stunned with the incredible storylines, combined with well-chosen and beautifully crafted techniques.

WHAT'S YOUR PARTY TRICK?
One drunken night, I once managed to negotiate a condom up my right nostril then out my mouth, keeping a grip of both ends. It was like the rope scene from *Poltergeist*. After tasting lubricant for weeks, I don't do party tricks anymore.

YOUR FAVOURITE PIECE OF ANIMATION EVER?
Good question. Probably the gorgon in *Clash of the Titans*.

IF YOU WON THE LOTTERY WHAT WOULD YOU DO/BUY?
I'd build a club in Central London, centred on stunning high-end visuals that actually went with the music.

IF YOU COULD BE ANY TIME OR ANY PLACE RIGHT NOW, WHERE WOULD YOU BE?
Where I assume everybody suffering our UK climate would like to be, drinking from a fresh coconut by the sea somewhere remote and tropical.

HOW DO YOU WANT TO BE REMEMBERED WHEN YOU'RE GONE?
I ain't going nowhere!



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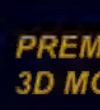
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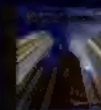
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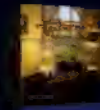
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